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This report of the 1968 American Educational Research Association (AERA) Research Training Presessions Program, designed to train educational researchers in fundamental research skills, includes introductory sections on background and planning and a major section consisting of descriptions and evaluations of each of the eleven 5-day sessions. The training areas in educational research included in the program are: reading skills; educational research management procedures; anthropological field methodology in the study of education (emphasizing classroom behavior and school administration); nonparametric methods in educatioal research; design and analysis of comparative experiments; new concepts in the scope, strategy, and purposes of evaluation; the computer and natural language; instructional product research (concerning the systematic development of education products that achieve prespecified instructional objectives); on-line computer applications in educational research; multivariate design and analysis in educational research (applied multiple linear regression); and development processes in college students. (SM)

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1968

AERA RESEARCH TRAINING PRESESSIONS PROGRAM

Director

Gene V. Glass

Laboratory of Educational Research

University of Colorado

SP002423

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INTRODUCTION

On February 3 through 7, 1968, the American Educational Research Association conducted a program of eleven training sessions for approximately 700 educational researchers prior to the Annual Meeting of the organization. The costs of the program were borne by AERA, the U. S. Office of Education, and the participants themselves. This document is a report to the funding agency and the officials of AERA concerning the research training presessions program.

HISTORY OF THE AERA PRESESSIONS PROGRAM

The American Educational Research Association Research Training Presessions Program has evolved over the past four to five years to where it now occupies a prominent position among the activities of the organization. The Presessions Program grew out of informal meetings of one or two days duration involving only a few selected researchers in AERA with rather narrow, common interests in 1964 and 1965 to a comprehensive program of eleven five-day sessions serving over 700 researchers (both members and non-members of AERA) and representing a total investment by the U. S. Office of Education, institutions of higher education, and individuals of nearly a quarter million dollars in 1968.

In 1964 and 1965, one or two small groups of researchers used the occasion of the Annual Meeting of AERA to meet and discuss their mutual interests. These meetings were not widely publicized and did not have the training of researchers as their function. They can, however, be regarded as the precursors of the AERA Research Training Presessions Program because it was in 1966 that the prototypal "Presession" was held as one of a group of three meetings in the tradition of these "special preconvention meetings." That one Presession that set a pattern subsequently adopted for the Presessions Program was the 1966 Presession on Experimental Design under the direction of Richard E. Schutz. The 1966 Presession on Experimental Design was full of "firsts". It was the first five-day Presession sponsored by AERA. It was the first formal research training program completed under Title IV of the Elementary and Secondary Education Act of 1965. It was the first Presession in connection with a professional meeting that was formally and fully evaluated with respect to the achievement of its objectives.

Encouraged by the success and acceptance of the 1966 Presession on Experimental Design and the growing interest of researchers in the possibility of expanding and formalizing the other pre-convention meetings, AERA presented six courses as the 1967 Presessions Program under the direction of Richard E. Schutz. The sessions and their directors were as follows:

1. Bayesian Statistical Analysis
   Donald Meyer, Syracuse University

2. Curriculum Research and Evaluation
   Robert L. Baker, Arizona State University

3. Design and Analysis of Comparative Experiments in Education
   Gene V. Glass, University of Illinois

4. Educational Research Management Procedures
   Desmond Cook, Ohio State University

5. Multivariate Design and Analysis in Educational Research
   Joe Ward, Southwest Educational Development Laboratory

6. Research Strategies with Culturally Deprived Children
   Martin Deutsch, New York University

The 1967 Presessions Program was supported in part by a grant from the U. S. Office of Education under Title IV of ESEA 1965. Approximately 500 researchers applied to the program, and 322 researchers who could be accommodated, actually participated.

In February of 1967, Dr. John I. Goodlad, newly elected President of AERA appointed six persons to the AERA Presessions Committee:

Gene V. Glass, Chairman
Richard C. Lonsdale, Division A - Administration
David B. Orr, Division B - Curriculum and Objectives
Richard C. Cox, Division C - Learning and Instruction
John A. Easley, Division D - Measurement and Research Methodology
John O. Crites, Division E - Student Development and Personnel Services

This committee was charged with planning and conducting the 1968 Presessions Program. It first undertook to state the purpose of the AERA Presessions Program. The following statement adopted by the Committee is dated March 17, 1967:

Statement of Purpose of the AERA Research Training Presessions

> Preamble: In February of 1966 and 1967 AERA conducted a limited program of Research Training Presessions prior to its Annual Meeting. In this program, groups of 40 to 75 educational researchers came together to receive instruction in research techniques from research methodologists. The fundamental purpose of this program was not always apparent to the directors and participants in these sessions nor to the general membership of AERA. A statement of purpose or intent of the AERA Research Training Program is overdue. This statement is a description of the service which AERA is extending to educational researchers through the medium of its Research Training Presessions Program.
>
> Supervised training in the technical skills used by the educational researcher is generally available to him only at considerable expense and inconvenience once he has completed his graduate education and has assumed full professional responsibilities. Often he must leave his work for an extended period of time and travel to find those competent to instruct him. Much of the expense and inconvenience can be spared him if instruction in research skills is condensed into short training sessions held either before or after the Annual Meeting of AERA. The purpose of the AERA Research Training Presessions Program is to train educational researchers in fundamental research skills, e.g., experimental design, statistical analysis, survey techniques, measurement theory and technique, electronic data

processing, the functions of the computer in research, research management. The Research Training Presessions are intended to be instructional or disseminative of established research techniques as opposed to generative of new substantive problems or directions for research in some particular area. The latter function is considered to be the purpose of symposia and conferences and, hence, it falls within the scope of the Annual Meeting of AERA and the activities of other professional organizations. It is also not the purpose of the Research Training Presessions to disseminate innovations in education (e.g., team teaching, the Initial Teaching Alphabet, micro-teaching) which are not properly research skills and techniques common to a large class of research activities.

Preference for participation in any Research Training Presessions will be given to researchers who hold a doctorate. This decision was made on the assumption (gratuitous, perhaps) that persons not holding a doctorate still have ample opportunities to improve their research skills while pursuing an advanced degree. On the other hand, the character of graduate education makes it relatively inaccessible to persons holding a doctorate who have assumed full professional responsibilities. Moreover, AERA is sensitive to the issue of intrusion upon the domain of univerisities, viz., the domain of graduate education of researchers.

It would be contrary to the spirit of this statement if the expressed purpose of the Research Training Presessions Program was regarded as fixed and immutable. The purpose of this program can properly be said to have evolved from the activities of the first few years of operations. We have simply attempted to identify that purpose so that AERA can see more clearly the need it is trying to meet and which needs remain unmet. It is hoped that in the future the Research Training Presessions Program will be altered when necessary and appropriate to meet the needs of the educational researcher.

AERA Research Training Presessions Committee
Gene V. Glass, Chairman
Richard C. Lonsdale, Division A
John A. Easley, Jr. Division B
David B. Orr, Division C
Richard C. Cox, Division D

Guided by the above statement of purpose of the program, the Committee undertook the planning and execution of the 1968 Research Training Presessions Program. The record of these activities constitutes the remainder of this report.

EVALUATION OF LONG-RANGE EFFECTS OF A 1967 RESEARCH TRAINING PRESESSION

The evaluation of the 1968 Presessions Program necessarily deals with short-term effects. Some indication of the long-term effects of the AERA Presessions Program are given in this section.

A brief questionnaire was mailed to the 70 participants of the 1967 Presession on the Design and Analysis of Comparative Experiments. This Presession was held at Grossinger, New York, on February 3-7, 1967, and was under the direction of Gene V. Glass, Kenneth D. Hopkins, and Jason Millman. Thus, the questionnaire sought to assess the effects of one 1967 Presession more than one year later. A total of 47 of the 70 participants responded to the questionnaire, producing a fairly typical return rate of 67%. The results are reported on the questionnaire itself in Table B.

Table B
AERA 1967 Presession Questionnaire
Follow-up Evaluation

Responses of the 47 respondents are recorded below:

1. a. Have you made an attempt in the last 15 months to increase your knowledge of experimental design and analysis as a result of your attendance at the 1967 Presession (i.e., did you do something you might not have done if you hadn't attended the Presession?)?

Yes - 41 No - 2 (Circle one)
No response - 4

b. If "Yes," how?

freq.
36 1. By studying the instructional materials handed out at the Presession.
35 2. By independent study from textbooks.
1 3. By enrolling in a formal course.
6 4. By attending one of the 1968 Presessions.
3 5. By attending some other "short-course" or "workshop".
5 6. Other. Please specify: 1. Conducting a 1968 Presession, 2. Teaching experimental design, 3. Writing a book, 4. Designing a new course.

2. a. Can you point to some specific use you have made of the skills and knowledge acquired at the 1967 Presession?

Yes - 46 No - 0 (Circle one)
No response - 1

b. If "Yes", what use(s)?

freq.

31 1. In the design or analysis of research performed by me.
25 2. In consulting with colleagues.
25 3. In consulting with others on the design and analysis of experiments.
20 4. In teaching my classes.
36 5. In advising graduate students engaged in research.
__ 6. Other. Please specify:

3. a. Have you felt more competent to read the research literature in your research specialty over the past 15 months than before as a result of the 1967 Presession?

Yes - 40 No - 7 (Circle one)

b. Have you felt more competent to design and analyze experiments over the past 15 months as a result of the 1967 Presessions?

Yes - 46 No - 1 (Circle one)

4. a. Have you written a research paper-either published or unpublished-which benefited from your attendance at the 1967 Presession?

Yes - 27 No - 19 (Circle one)
No response - 1

1. If "Yes", and if the paper or papers were published, where were they or will they be published? J. Ed. Psych. - 3; USOE Report - 2; Amer. J. Ment. Def. - 2; J. Ed. Res. - 2; Reading Teacher; Child Devel.; J. Hum. Res.; Psych. in Schools; J. Creat. Bev.; Read. Res. Quar.; EPIE Forum.

5. a. Have the conditions of your employment changed wholly or partially as a result of your attendance at the 1967 Presession?

Yes - 7 No - 39 (Circle one)
No response - 1

If "Yes", please explain: was made Res. Dir. at SUNY; increase in teaching exper. des.; directs research of graduate students.

b. Have you taken a more active interest in some professional organization (e.g., AERA, ASCD) as a result of the 1967 Presession?

Yes - 16 No - 31 (Circle one)

If "Yes", which organization: AERA named 14 times. Other organizations named were PDK, Amer. Voc. ED. Res. Assoc., ASCD, Can. Ed. Res. Assoc.

6. Please rank each of the following activities from 1 (most valuable) to 5 (least valuable) in terms of the value of the activities for your professional growth:

Average Rank	Activity
1.71	A post-doctoral fellowship for a year of study.
3.02	An AERA Presession like the one you attended.
2.69	An eight-week "summer institute".
3.87	Self-study from textbooks.
3.71	A semester-long academic course.

The responses to item #1 indicate that in almost all cases (41 out of 47) the 1967 Presession acted as a stimulus to further study. Study of the subject matter did not cease with the end of the five-day sessions but was extended through rereading instructional materials obtained at the Presession and through self-study of textbooks. From the wording of the question, we may assume that these extended efforts at self-improvement can be attributed to attendance at the 1967 Presession.

We see in item #2 that the skills acquired during the 1967 Presession were applied in educational research endeavors. About 80% of the respondents reported that the Presession helped them in advising graduate students engaged in research. About 60% of the respondents reported using the skills they acquired in designing and analyzing their own research. More than half of the respondents were helped in consulting with their colleagues and others on research design and analysis. Somewhat less than half of the respondents made use of the newly-acquired skills in their teaching. A "spread of effect" of instruction is evident in the responses to item #2. Indeed, it is probably no exaggeration to say that literally hundreds of persons (students, faculty members, public school personnel, etc.) benefited-to a greater or lesser extent-from the instruction given to 70 participants in the 1967 Design and Analysis Presession.

In item #3, it is seen clearly that in the opinion of the respondents, participation in the 1967 Presession resulted in increased research competence which was not transitory, but was maintained 15 months after the Presession.

In item #4, about 60% of the respondents indicated that the skills acquired in the 1967 Presession were put to use in reporting published or unpublished research. As can be seen under 4(a), an impressive array of professional journals are the benefactors of instruction at the 1967 Design and Analysis Presession.

Seven out of 47 persons indicated in item #5 that the conditions of their employment were changed as a result of attendance at the 1967 Presession. In all but one instance, the "change" was one of emphasis and responsibility at the participant's previous place of employment instead of a change of place of employment. In part(b) of #5, 14 of 47 persons indicated that they have taken a greater interest in AERA as a result of attendance at the 1967 Presession.

Item #6 is of particular interest. Respondents were asked to rank five educational activities from 1 (most valuable) to 5 (least valuable) in terms of their professional growth. Average ranks were calculcated for the rankings of the 47 respondents. The lower the average rank, the more valuable the activity was considered to be by the group of respondents. Attendance at an AERA Presession was ranked third among the five activities. The respondents considered the Presession more valuable than taking a semester-long academic course of self-study from textbooks. Indeed, attendance at a Presession was considered only slightly less valuable than attendance at an eight-week long "summer institute".

Conclusion: The effects of a 1967 Presession were maintained over 15 months, were spread to the colleagues and students of the participants, and were considered only slightly less valuable than those which might result from attendance at an eight-week "summer institute".

SELECTING THE PRESESSIONS PROGRAM

In March 1967, proposals for research training sessions were solicited by two means: (1) an announcement appeared in the March issue of the Educational Researcher, the official newsletter of AERA, that any individual was welcome to submit a proposal to conduct a presession; (2) invitations to conduct a presession were sent to some 200 leading researchers suggested by members of the Committee. Proposals were required to reach the Committee Chairman by April 1, 1967.

Thirty proposals to conduct presessions were received by the deadline for submission. (Unfortunately, one excellent proposal was received after the Presessions Committee met to select the 1968 Program and could not be considered.) The Presessions Committee met in early April of 1968 in Chicago to evaluate the proposals and select the 1968 Presessions Program. Two of the proposals were screened out by the Chairman of the Committee prior to the meeting as not being worth the Committee's time. The remaining 28 proposals were read and evaluated by the Committee members in accordance with the schedule under I below and with respect to the criteria in II:

Proposal Reading Schedule

I. Schedule of Reading and Judging Proposals
  Division A: Lonsdale
    Proposals #1,3,4,7,8,11,13,14,19,21, and 27

  Division B: Glass
    Proposals #3,9,10,12,15,16,18,21,22,23,25, and 28

  Division C: Wiley
    Proposals #2,5,8,14,18,20,22,24,25,26, and 28

  Division D: Cox
    Proposals #2,6,9,10,11,12,15,17,19,20, and 26

  Division E: Thoresen
    Proposals #1,4,5,6,7,13,16,17,23,24, and 27

  (Each proposal is to be read by at least two persons.)

II. Criteria for Rating Proposals
  A. Staff
    1. Experience and capability (low-high)
    2. Staff/participant ratio (low-high)
    3. Degree of commitment (low-high)

  B. Content (topic)
    4. Importance (need) (low-high)
    5. Appropriateness to Presession format (low-high)
    6. Extent of Planning

C. Potential Audience
   7. Probable size (small-large)
   8. Relationship to AERA (distant-close)

D. Schedule
   9. Fullness (low-high)

E. Evaluation
   10. Extent of planning (low-high)
   11. Comprehensiveness (low-high)

(Each of the eleven criteria were rated on a scale from 0 to 9.)

In addition, each proposal was given one of the following over-all ratings:

A - Reject
B - Accept conditionally
C - Accept with recommendations
D - Accept unconditionally

Presession Proposals

1. Astin, Alexander W.
   Assessing the Educational Environment and its Impact on Student Development

2. Baker, Robert L.
   Planning Educational Experiments

3. Bellack, Arno
   Curriculum Theory

4. Bolton, Dale L.
   Experimentation in Educational Administration

5. Bormuth, John R.
   Research in Reading Instruction

6. Campbell, David P.
   Interest Measurement Research

7. Cook, Desmond
   Educational Research Management Procedures

8. Cooper, James M.
   A Behavioral Approach to Teacher Education

9. Gordon, Jack
   Application of Facet Analysis to Theory Construction

10. Hunka, S. M.
    APL: A Programming Language

11. Lutz, Frank W.
    Anthropological Field Methodology in the Study of Education: With Particular Emphasis on Classroom Behavior and School Administration

12. Marascuilo, Leonard A.
    Nonparametric Methods in Educational Research

13. Marshall, Jon C.
    Practicum in Research Financing

14. Mayo, Samuel T.
    Subdoctoral Training of Educational Research Workers

15. Mayo, Samuel T.
    Mastery, Transfer, and Growth of Measurement Competency for Educational Personnel

16. Medley, Donald M.
    Techniques for Measuring Teachers' Classroom Behavior

17. Millman, Jason
    Design and Analysis of Comparative Experiments

18. Naumann, Theodor F.
    Evaluation in Early Childhood Education

19. Pace, C. Robert
    Evaluation: New Concepts in Scope, Strategy, and Purposes

20. Page, Ellis B.
    The Computer and Natural Language

21. Popham, W. James
    Instructional Product Research

22. Ragsdale, Ronald G.
    On-line Computer Applications in Educational Research

23. Romberg, Thomas A.
    Evaluating School Mathematics Programs

24. Spencer, Richard E.
    Instructional Research

25. Twelker, Paul A.
    Instructional Gaming and Simulation

26. Ward, Joe H.
    Multivariate Design and Analysis in Educational Research

27. Warren, Jonathan R.
    Developmental Processes in College Students

28. Wilds, Preston L.
    Workshop on Strategies for Teaching and Evaluating Problem Solving Behaviors

Those proposals which both readers voted "reject" were eliminated from further consideration. Those rated "accept unconditionally" by both readers were selected for the Presessions Program. Proposals rated as "reject" by one reader and "accept" by the second reader were discussed by the Committee in light of the eleven evaluative criteria until a consensus (accept or reject) was reached. In certain instances, a proposal was read by two other Committee members who also voted acceptance or rejection. Eventually, eleven Presessions were judged worthy of support by the Presessions Committee. Their titles and directors were as follows:

1. Research in Reading Instruction - John R. Bormuth, University of Chicago

2. Educational Research Management Procedures - Desmond L. Cook, Ohio State University

3. Anthropological Field Methodology in the Study of Education: With Particular Emphasis on Classroom Behavior and School Administration - Frank W. Lutz, New York University

4. Nonparametric Methods in Educational Research - Leonard A. Marascuilo, University of California-Berkeley

5. Design and Analysis of Comparative Experiments - Jason Millman, Cornell University

6. Evaluation: New Concepts in Scope, Strategy and Purposes - C. Robert Pace, University of California - Los Angeles

7. The Computer and Natural Language - Ellis B. Page, University of Connecticut

8. Instructional Product Research - W. James Popham, University of California - Los Angeles, and Howard Sullivan, Southwest Regional Laboratory for Educational Research and Development - Los Angeles

9. On-line Computer Applications in Educational Research - Ronald G. Ragsdale, Ontario Institute for Studies in Education

10. Multivariate Design and Analysis in Educational Research- Joe H. Ward, Southwest Educational Development Laboratory, San Antonio, Texas

11. Developmental Processes in College Students - Jonothan R. Warren, Educational Testing Service, Berkeley, California

PRESESSIONS PLANNING MEETING

On September 15, 1967, a meeting of the eleven Presessions Directors was held to discuss problems of publicity, application procedures, evaluation, and coordinating administrative efforts. The minutes of this meeting follows:

"Minutes of the AERA 1968 Research
Training Presessions Directors Meeting"

Date: Friday, September 15, 1967
Place: O'Hare Inn, Chicago

In Attendance: Presessions Directors Cook, Marascuilo, Millman, Page, Popham, Ragsdale, Ward, and Warren; Presessions Committee Chairman Glass, AERA Central Office representative Hanna, NISEC representative Beggs, Janos Koplyay

1. Presession Sites: Sites have been chosen for all eleven Presessions:

    1. Bormuth - The Abbey on Lake Geneva
    2. Cook - Chicago-Sheraton
    3. Lutz - Chicago-Sheraton
    4. Marascuilo - Chicago-Sheraton
    5. Millman - The Abbey on Lake Geneva
    6. Pace - Chicago-Sheraton
    7. Page - Pheasant Run, St. Charles, Illinois
    8. Popham & Sullivan - Chicago-Sheraton
    9. Ragsdale - Pheasant Run, St. Charles, Illinois
    10. Ward - Northwestern University
    11. Warren - Oakton Manor, Pewaukee, Wisconsin

2. Directors' Names and Addresses: At Jim Popham's suggestion, a list of the names and addresses of the Presessions Directors is enclosed in this mailing.

3. Publicity: Notice of the 1968 Presessions should appear soon in issues of the American Psychologist, Kappan (PDK), APA Div. 15 Newsletter, and the NCME Newsletter. It is probably too late to enter notices into other journals or periodicals.

   We will have to depend upon publicity (synopses of all 11 Presessions and an application form) in the October issue of the Educational Researcher which has already been mailed to the membership of AERA. In addition, a printed flier will soon be completed and sent to schools of education, and departments of psychology and sociology across the country. If you want copies of this flier for mailing to special sources, request as many as you need from Gene Glass.

Directors have complete freedom to publicize their individual Presessions where and how they wish.

4. Application Procedures: The following procedures for processing applications have been adopted.

    A. Applications received by Glass by November 15. (A first and second choice of a Presession will be indicated on each application-see the October Educational Researcher.)

    B. All applications indicating your Presession as first choice will be forwarded to you by November 18. (You will continue to receive late applications until you inform me that you have started to select participants.)

       You will also receive a tally sheet on which the first and second choices of all applicants are recorded.

    C. Select "accepted" and "rejected" from among first choice applicants. (Take into consideration how many applicants chose your session second and the maximum number of participants being accepted by the other sessions.)

    D. Return applications of "rejected" applicants and facsimiles of the applications of "accepted" applicants to Glass by December 2. (Be sure to indicate which were accepted and which were rejected.)

    E. By December 7, you will receive the applications of all those who chose your session second-provided they were not accepted by their first-choice session and provided vacancies remain in your session.

    F. Select "accepted" and "rejected" from among your second-choice applicants and return applications (or facsimiles) to Glass.

    G. Notify all applicants of your decision by December 15. (Notifying all applicants is your responsibility. However, if you have no room for any second-choice applicants, Glass will not send you second-choice applications, and he will notify them that your session is full.)

5. Evaluation: The following information will be needed from each Director so that the Presessions Committee can produce a final evaluation report:

    a. Names of participants in attendance.
    b. Statement of objectives.
    c. A listing and two copies of all instructional and evaluation materials.

d. Summaries of results of mastery tests, attitude inventories, semantic differentials, etc.
e. Actual schedule of activities.
f. Attendance record (number in attendance only).
g. Results of staff and participant critique forms.
h. Director's written observations.

The "staff" and "participant critique forms" will be prepared centrally and mailed to the Presession Directors in October.

The evaluation reports of the 1966 and 1967 Presessions on the Design and Analysis of Experiments can be helpful to you in planning to evaluate your session.'

The planning meeting proved to be invaluable. It is recommended that similar meetings be included in future Presessions Programs.

PUBLICITY

Two main communications channels were utilized to publicize the 1968 Presessions Program: mailings to academic departments, announcements in professional journals and newsletters.

The yellow, printed announcement bound in this report was sent to all colleges of education listed in the Education Directory (Higher Education, Part 3, 1965-66) on September 1, 1967. Hence, almost every college of education in the country received an announcement of the Presessions Program which they were requested to post.

Several copies of the same announcement were sent to the chief state school officer of every state in the United States plus Guam, Puerto Rico, the Trust Territory of the Pacific Islands, and the Virgin Islands on October 1, 1967.

The same printed announcement was sent to 400 persons on the roles of the Association for Institutional Research on October 1, 1967.

The following announcement appeared in the October 1967 issue of the Phi Delta KAPPAN, the official journal of Phi Delta Kappa, with a circulation of approximately 75,000 persons:

> "Training Sessions at AERA
>
> The American Educational Research Association has announced that 11 research training sessions will be held in Chicago, February 3 to 7, immediately preceding the annual AERA meeting. The sessions are open to any holder of a Ph.D. or Ed.D. degree, whether or not he is a member of AERA. Titles of the sessions and names of the directors are as follows:
>
> 1. Research in Reading Instruction-John R. Bormuth, University of Minnesota.
>
> 2. Educational Research Management Procedures - Desmond Cook, Ohio State University.
>
> 3. Anthropological Field Methodology in the Study of Education: With Particular Emphasis on Classroom Behavior and School Administration-Frank W. Lutz, New York University.
>
> 4. Nonparametric Methods in Educational Research-Leonard A. Marascuilo, University of California-Berkeley

5. Design and Analysis of Comparative Experiments-Jason Millman, Cornell University.

6. Evaluation: New Concepts in Scope, Strategy, and Purposes-C. Robert Pace, University of California-Los Angeles.

7. The Computer and Natural Language-Ellis B. Page, University of Connecticut.

8. Instructional Product Research-W. James Popham, University of California-Los Angeles, and Howard Sullivan, Southwest Educational Research Lab-Los Angeles.

9. On-line Computer Applications in Educational Research-C. Ronald Ragsdale, Ontario Institute for Studies in Education.

10. Multivariate Design and Analysis in Educational Research-Joe H. Ward, Southwest Educational Development Laboratory, San Antonio, Texas.

11. Development Processes in College Students-Jonathan R. Warren, College Student Personnel Institute, Claremont, California."

The following announcement appeared in the September 1967 issue of the American Psychologist, a publication of the American Psychological Association with a circulation over 30,000:

> "At the Annual Meeting of the American Educational Research Association to be held in Chicago February 8-10, 1968, 11 5-day sessions will be held as presessions. Participation in this program will not be restricted to AERA members, but is intended for persons who have an interest in educational research. Participation is restricted to persons holding a doctorate. For further information and application forms write to: Gene V. Glass, Laboratory of Educational Research, University of Colorado, Boulder, Colorado 80302."

An announcement similar to the one mailed to all colleges of education appeared in the September issue of the NCME (National Council on Measurement in Education) Newsletter which has a circulation of approximately 2,000.

The following announcement appeared in the newsletter of the National Society for Programmed Instruction:

> "November 15 is the registration deadline for the eleven five-day Research Training Presessions to be held by the American

Educational Research Association in Chicago from February 8-10, 1968, just prior to its annual meeting there.

These sessions will be conducted by outstanding research authorities from all parts of the United States, including one on "Instructional Product Research" with NSPI member Dr. W. James Popham of the UCLA Education Department and Howard Sullivan of the Southwest Educational Research Laboratory in Los Angeles as joint directors.

No fees will be charged and participation in these Presessions will not be restricted to AERA members.

Further information can be obtained from Dr. Gene V. Glass, Laboratory of Educational Research, University of Colordao, Boulder, Colorado 80302. "

In addition, announcements of the 1968 Presessions Program appeared in several issues of the AERA newsletter Educational Researcher during 1967. This newsletter has a circulation of about 7,500 persons.

A conservative estimate of the number of persons reached by the total effort to publicize the Presessions Program is 100,000 persons. Publicity could have been improved by attempts to reach professional organizations such as the Association for Supervision and Curriculum Development, the American Association of School Administrators, the American Sociological Association, and others. In addition, a greater effort should be made in the future to publicize the Presessions Program among public school personnel.

PLEASE POST

AERA

AMERICAN EDUCATIONAL RESEARCH ASSOCIATION

1968 RESEARCH TRAINING PRESESSIONS PROGRAM

February 3-7, 1968

A grant from the Training Research Branch of the U.S. Office of Education will make possible a program of eleven five-day sessions to be held as presessions in connection with the Annual Meeting of the American Educational Research Association in Chicago during February, 1968. The titles and names of the directors of the eleven research training sessions are as follows:

1. Research in Reading Instruction - John R. Bormuth, University of Chicago
2. Educational Research Management Procedures - Desmond L. Cook, Ohio State University
3. Anthropological Field Methodology in the Study of Education: With Particular Emphasis on Classroom Behavior and School Administration - Frank W. Lutz, New York University
4. Nonparametric Methods in Educational Research - Leonard A. Marascuilo, University of California-Berkeley
5. Design and Analysis of Comparative Experiments - Jason Millman, Cornell University
6. Evaluation: New Concepts in Scope, Strategy and Purposes - C. Robert Pace, University of California-Los Angeles
7. The Computer and Natural Language - Ellis B. Page, University of Connecticut
8. Instructional Product Research - W. James Popham, University of California-Los Angeles, and Howard Sullivan, Southwest Regional Laboratory for Educational Research and Development-Los Angeles
9. On-line Computer Applications in Educational Research - Ronald G. Ragsdale, Ontario Institute for Studies in Education
10. Multivariate Design and Analysis in Educational Research - Joe H. Ward, Southwest Educational Development Laboratory, San Antonio, Texas
11. Developmental Processes in College Students - Jonathan R. Warren, Educational Testing Service, Berkeley, California

Participation in the AERA 1968 Research Training Presessions Program is not restricted to AERA members. The Presessions Program is intended for persons who have an interest in educational research. Participation is generally restricted to persons holding a doctorate—Ph.D. or Ed.D without regard to academic area. Neither fees nor tuition is charged for any of the sessions; however, each participant must pay his own board and room.

Further information—synopses of the content of the sessions, etc.—and an application form appear in the October issue of the AERA newsletter, **Educational Researcher,** or can be obtained by writing

Dr. Gene V Glass
Laboratory of Educational Research
University of Colorado
Boulder, Colorado 80302

THE DEADLINE FOR RECEIPT OF APPLICATION FORMS IS NOVEMBER 15, 1967

APPLICATION PROCEDURES AND THE APPLICANTS

The October 1967 issue of the Educational Researcher, the AERA newsletter, carried a "call for applications" to the 1968 Presessions Program. This announcement--a copy of which is bound in this report--carried a description of the staff, content and objectives, and the anticipated audience for each of the eleven Presessions; the requirements for application; and an application form.

Each applicant completed the application form in part III of the announcement and sent it to the Director of the Presessions Program. Applications were received by the Director so their rate of receipt and distribution among the Presessions could be recorded. Although a deadline of November 15, 1967, had been set for receipt of applications, too few applications were received by that date so the deadline was extended. A notice of the indefinite extension of the deadline appeared in the December issue of the Educational Researcher. Applications were received until January 31, 1968. With this alteration, then, the procedures for selecting the applicants was the one agreed upon at the September Directors meeting:

1. Select "accepted" and"rejected" from among first-choice applicants. (Take into consideration how many applicants chose your session second and the maximum number of participants being accepted by the other sessions.)

2. Return applications of "rejected" applicants and facsimiles of the applications of "accepted" applicants to Glass by December 2. (Be sure to indicate which were accepted and which were rejected.)

3. By December 7, you will receive the applications of all those who chose your session second--provided they were not accepted by their first-choice session and provided vacancies remain in your session.

4. Select "accepted" and "rejected" from among your second-choice applicants and return applications (or facsimiles) to Glass.

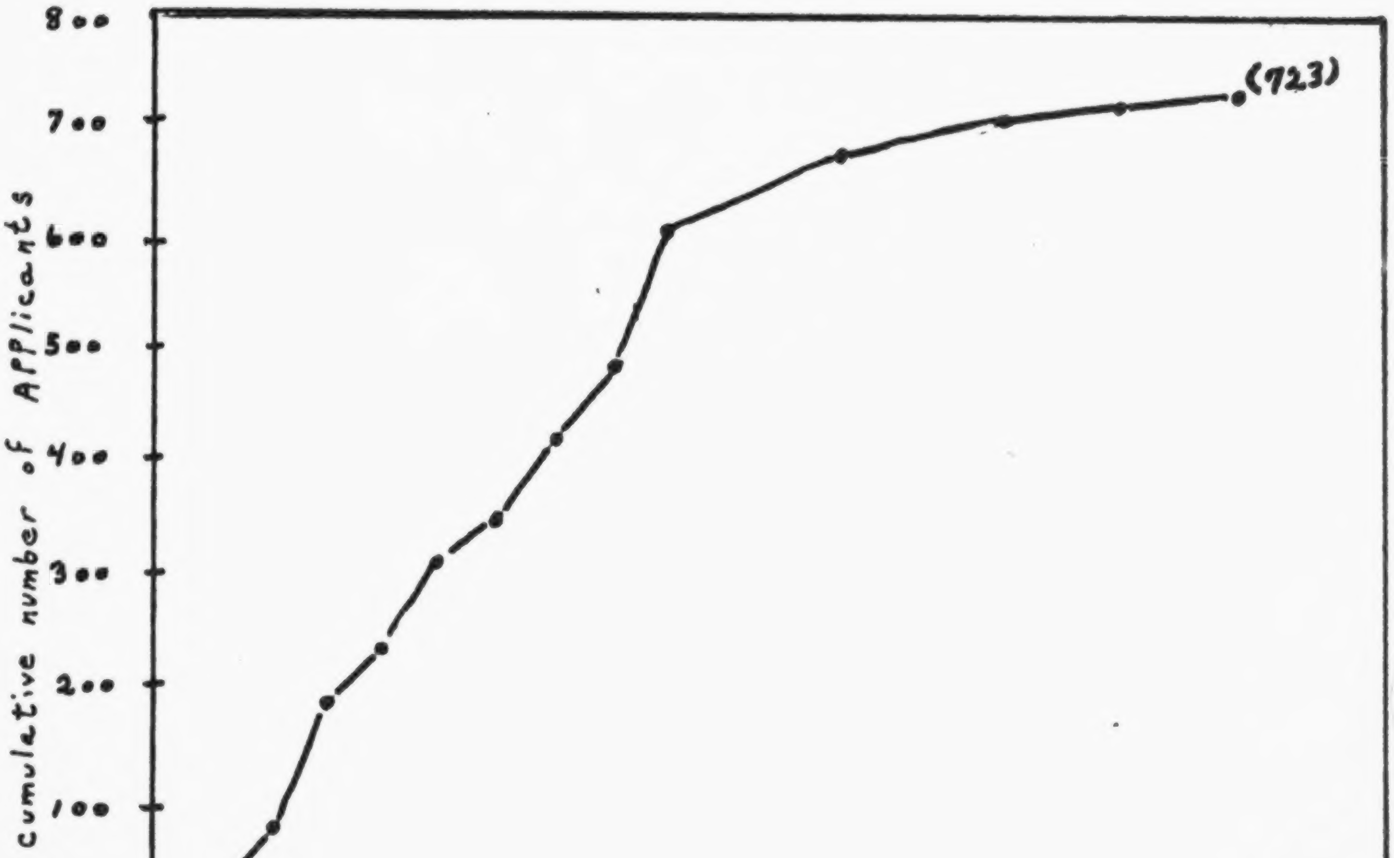
5. Notify all applicants of your decision by December 15. (Notifying all applicants is your responsibility. However, if you have no room for any second-choice applicants, Glass will not send you second-choice applications, and he will notify them that your session is full.)

Most Presession Directors selected applicants until late January 1968. The rate of receipt of applications for the entire Presessions Program was as follows:

Date	Total Accumulated Number of Applicants
September 22, 1967	8
September 29, 1967	79
October 6, 1967	188
October 13, 1967	236

October 20, 1967	308
October 27, 1967	353
November 3, 1967	422
November 10, 1967	486
November 17, 1967	611
November 24, 1967	-
November 30, 1967	-
December 8, 1967	670
December 15, 1967	-
December 22, 1967	-
December 30, 1967	712
January 7, 1968	-
January 15, 1968	736
January 22, 1968	-
January 31, 1968	743

A graph of the cumulative number of applications over time is reproduced below:



Rate of Receipt of Applications From September 22, 1967 to January 31, 1968

In Table A appears the distribution of the applicants' first and second choices for Presessions. As examples of how Table A is read, six persons indicated session #1 as their first choice and session #3 as their second choice, ten persons who indicated session #7 as their first choice did not indicate a second choice, and a total of 74 persons chose session #10 first. In the column farthest to the right appears the maximum number of participants which the Director would accept. The total maximum number of persons which could be accommodated in the total program was 745.

It is interesting to note that about 40% of the persons who chose Presession #1 did not indicate a second choice; approximately 45% of those choosing Presession #3 first did not indicate a second choice. These two sessions (Reading Research and Anthropological Field Methodology) appear to have appealed to two groups of researchers with specific needs which could not be met by other Presessions on the program. Certain pairs of Presessions on the program are paired relatively often as either a first or second choice, indicating a clustering of sessions in terms of common interests of the applicants. Sessions #4 and #5 were often paired as first or second choices; sessions #6 and #11 (Warren) were frequently paired; sessions #7 and #9 (both involving computers) were often chosen together.

The Presessions were ordered as follows in terms of number of first choices:

Presession	Number of Applicants
Evaluation (6)	136
Experimental Design (5)	82
Reading Research (1)	76
Anthropological Field Methodology (3)	76
Multivariate Design and Analysis (11)	74
Instructional Product Research (8)	69
Research Management Procedures (2)	59
Developmental Processes of College Students (10)	54
Nonparametric Methods in Educational Research (4)	45
On-line Computer Applications (9)	38
Computer and Natural Language (7)	34
	743

The large number of applicants to Presession #6 on Evaluation may be indicative of its broad appeal to practitioners and the great need for such instruction occasioned by federal legislation. Although the content of Presession #5 on Experimental Design was rather technical, its relatively great appeal may be due to the fact that the subject matter has application across most fields in educational research and that 1968 was the third consecutive year for a session of this type. Although the Presessions on Reading Research and Anthropological Field Methodology necessarily drew applicants with rather specific needs and interests (support for this is also found in the fact that about 40% of the persons applying to one or the other of these Presessions indicated no second choice), they still received a sizeable number of applicants and were tied for third and fourth rank among the eleven Presessions. Because their content appeared to be either highly technical or specialized, Presessions #4, #9 and #7 probably appealed to fewer applicants than did the other Presessions; if it was not the case that these Presessions were technical or specialized, then we may have been unsuccessful in portraying them correctly in publicity. *In the future, it might be wise to make detailed outlines of course content available to potential applicants upon request. One can not fully portray the nature of a Presession through the media of publicity used for the 1968 Presessions Program*.

Table A

Presessions Applications Tally

(Frequencies of First and Second Choices)

First Choice

	1 Bormuth	2 Cook	3 Lutz	4 Marascuilo	5 Millman	6 Pace	7 Page	8 Popham-Sullivan	9 Ragsdale	10 Ward	11 Warren	Maximum Group Size
1. Bormuth		0	2	2	4	4	0	1	0	0	1	75
2. Cook	3		6	1	4	11	0	7	3	2	1	50
3. Lutz	6	3		3	6	9	1	2	2	1	1	75
4. Marascuilo	4	1	3		22	10	2	2	2	11	4	100
5. Millman	10	10	5	15		31	3	6	4	12	2	80
6. Pace	8	18	13	7	12		3	21	3	4	18	80
7. Page	3	0	3	1	0	0		1	5	6	0	50
8. Popham-Sullivan	9	6	4	3	8	19	1		1	4	3	50
9. Ragsdale	2	2	1	3	8	9	9	1		11	2	60
10. Ward	1	2	2	3	10	7	4	3	6		6	50
11. Warren	0	2	5	4	2	11	1	7	3	6		75
No second choice	30	15	32	3	6	25	10	18	9	17	16	745
Total First Choices	76	59	76	45	82	136	34	69	38	74	54	

Total Number of Applicants=743

DESCRIPTION OF THE APPLICANTS

A random sample of 200 from a pool of 743 applicants was drawn for purposes of description of those researchers who apply to the AERA Presessions Program. (The characteristics of the participants in individual Presessions are described in the individual Presession reports to follow.)

Sex: Approximately 80% of the applicants to the Presessions Program are male. A random sample of 200 persons from the AERA Directory for 1967-68 showed that 80.5% of the membership is male. Presumably, then, there is no "gender-bias" in the AERA Presessions Program. It might have been true that females find it less difficult to get away for five days to attend than males, for example. However, there is clearly no evidence for this.

Age: In an accompanying figure, an age pyramid for males and females who applied to the Presessions Program is presented.

Geographic Distribution: In an accompanying figure, the geographic distribution of the 743 applicants to the 1968 Presessions Program is depicted. As an example of how this figure is interpreted, note that 8.5% of the 743 applicants came from the "West Coast" (Washington, Oregon, California, Nevada, and Arizona) or that 38.5% of the applicants came from the upper-Midwest (Minnesota, Wisconsin, Iowa, Missouri, Illinois, Indiana, Michigan, and Ohio).

The geographic distribution of applicants is out of proportion to their membership in AERA. The ratio of AERA members in the "upper-Midwest" to AERA members on the "West Coast" is two to one (approximately 1,800 for the former and 900 for the latter). However, there were almost five times as many Presessions applicants from the "upper-Midwest" as from the "West Coast". Approximately 26% (22.5% plus 3.5%) of the applicants came from the "East Coast" and "New England". This region contributes almost the same number of members to AERA as does the region designated "upper-Midwest" in the figure. However, the "upper-Midwest" region (within 250 miles of Chicago) contributed 1.6 applicants for every 1.0 applicants from the "East Coast" and "New England." These data support a "conve hypothesis" about attendance at a Presessions Program. It appears that travel distance (expense, time, etc.) are important factors in a potential applicant's decision to apply. An alternative explanation of the data is that people in the "upper-Midwest" are more likely to attend any AERA function--regardless of location--since a history of Chicago-based Annual Meetings has instilled a "convention-going" habit in them. The 1969 Annual Meeting in Los Angeles will provide an opportunity to choose between these competing hypotheses.

If the trend observed here is corroborated, AERA should consider whether the needs of its membership would be better served by one of the following plans:

a. Conduct different Presessions at different locations around the country during the same week.

b. Conduct the same Presession at different locations around the country on different occasions.

c. Assist participants in defraying travel expenses to and from the Presessions Program.

Place of Employment: Among the 743 applicants, the following distribution of places of employment were observed:

Place of Employment	Percent
1. College or University	71%
2. Public School Systems	15%
3. Federal Government	6%
4. State Departments of Education	4%
5. Other (IBM, SRA, 3M, etc.)	4%
	100%

The bulk of the Presession applicants are employed by universities and colleges, as one might expect. The second largest source of applicants was public school systems; it is encouraging that nearly one out of seven applicants came from and returned to public school systems. One applicant in ten came from either the federal or state government. The 4% of applicants labeled "other" came primarily from business and industry. The industry-based educational researcher appears to be a new phenomenon. The interest of these people, numbering approximately 30, should be encouraged in future AERA Presessions Programs. Specifically, the program should be publicized in the major industries and Presession proposals should be solicited from people working in the industrial setting.

It appears, however, that the majority of Presession participants will continue to be drawn from the university-college setting. In one sense, this is highly desirable. As has been documented elsewhere in this report, there exists a substantial "spread of effect" of the Presession instruction. Many participants return to universities to teach courses, advise graduate students, and consult with colleagues both inside and outside the academic setting. The opportunities for academic personnel to transmit skills and knowledge to many educational researchers are greater than for people in public school systems, state and federal government, and industry.

Previous Attendance at Presessions: Approximately 15% of the applicants indicated that they had attended an AERA Presession in either 1966 or 1967. It is impossible to "interpret" this figure other than to say that it is "better" than 0% and probably not as high as it could be.

Academic Training: About 81% of the applicants held an earned doctorate. Originally, participation in the Presessions Program required a doctorate. The intent of placing this requirement for attendance was to exclude full-time and part-time graduate students, and thus not encroach upon the domain of higher education. However, it has become apparent that although the requirement of the doctorate from participants was a way of avoiding an encroachment upon the graduate programs of colleges and universities, it excluded other worthy applicants. Many applicants (in public schools, laboratories, academic institutions, etc.) could make convincing cases that they needed the instruction offered in the Presessions Program and that to receive it would not usurp the role of a university graduate program. Most of these persons had no formal ties with such graduate programs and planned to have none. In a few instances, graduate students were admitted (with the blessing of their university) because their university could not offer the type of instruction offered in the Presessions Program (these instances were very few in number, however).

The procedure adopted for the 1968 Presessions Program, namely to exclude "students enrolled in the graduate program of an institution of higher learning," seems best. Exceptions can be made when a student can show that the instruction offered in a Presession can not be duplicated on his campus. It would not be advisable in the future to require a doctorate of Presessions participants since this year one out of five applicants did not have the degree.

Research Productivity: On the average, the participants had published 2.90 articles in scholarly ("refereed") journals and had directed 0.89 funded research projects. The average holder of a doctorate in education probably publishes less than two articles in scholarly journals in his lifetime. The Presession participants have already shown signs of above average productivity early in their professional lives. Thus it would appear that the Presessions Program is primarily serving "researchers" who are refreshing or extending their research skills. In general, it is not making "researchers" out of "non-researchers".

There appeared to be some slight evidence (not reported here) that the more "academically oriented" Presessions, e.g., #3, #4, #5, and #11, attracted more productive researchers than the less academic (more applied and practical) Presessions, e.g., #2,#6, #7, #8, and #9. It would appear, then, that a program of Presessions could be offered that would appeal to those persons now producing little research (e.g., research on curriculum development, research on school finance, evaluation, etc.).

Description of Participants of 1968 AERA Presession on Research in Reading*

Characteristic	Percentage				
Sex	Male			Female	
	39			61	
	1936-1943	1944-1951	1952-1959	1960-	without
M.A. Degree	2	19	39	37	3
Ph.D. Degree		4	19	54	23
Nature of Employment	Professor	Assoc. Professor	Assist. Professor	Coord., Res. Assist., etc.	
	4	19	46	28	
Percentage of Time Allocated to Teaching	0 - 50	51 - 75	76 - 90	91 - 100	
	26	19	22	33	
Courses Taught	Lang. Arts	Research	Develop.	Remedial	
	9	5	35	40	
Level of Courses Taught	Undergraduate		Graduate		
	37		40		
Primary Research Interest	Research Design	Soc.	Pedag.	Psych.	
	26	4	56	23	
Research Articles theses, or technic. reports, pub. or unpub.	0 - 2	3 - 5	5 - 10	10 +	
	33	28	18	20	
Funded Research Projects	0	1 - 2	3 +		
	59	30	7		

Description of Participants (cont.)

Characteristic	Percentage		
Professional Societies	IRA	APA	Ph.D.K.
	59	18	9

* This does not include those who were accepted but did not attend.

PRESESSION I

RESEARCH IN READING

Director

Dr. John R. Bormuth
University of Chicago
Chicago, Illinois

INTRODUCTION

Fifty-one educational researchers interested in doing research in reading instruction met for four and one-half days from 2 through 7 February, 1968. Their object was to learn what research is being carried on in reading instruction, the methods and theoretical competencies necessary for the conduct of this research, and the directions being taken by the leaders in this area.

The sessions consisted of morning and afternoon lectures with the participants splitting into several seminars in the evenings. The lectures provided for organized presentations of the rationales and methods used in the various types of research discussed. The seminars were designed to permit the participants to explore in greater detail the topics in which they had special interests. There were totals of nine lectures and fourteen seminars.

The participants exhibited a broad range on almost any dimension on which they were examined. The ranges were accounted for almost entirely by the fact that two fairly distinct populations are interested in research in reading. There was a substantial number of educational psychologists who exhibited their usual pattern of having a fair to good background in research design and learning and cognitive psychology but almost no knowledge of linguistics, verbal learning, instructional design, and reading curriculum. The second major group consisted of reading specialists who exhibited roughly the reverse pattern except that they also possessed too little knowledge of linguistics and verbal learning to permit them to understand the major independent variable of reading instruction, language.

STAFF AND INSTRUCTION

The instruction was planned around the characteristics anticipated (and actually observed) in the participants. Dr. Richard Venezky, who holds an M.A. in Psychology from Cornell and a Ph.D. in Linguistics from Stanford, introduced the participants to basic linguistic concepts, and discussed the methods and problems of studying both the grapho-phonemic relationships of the language and the learning of these relationships by children. Many of his illustrations came from his own research.

Dr. E. B. Coleman, a well known psycholinguist who has been studying the problems of designing instruction in beginning reading, focused his attention on the relevance of both verbal learning and linguistic theory to the design of instruction. In his lectures and seminars he dealt with the problems of maximizing simultaneously the large numbers of response outcomes in beginning reading while minimizing undesirable outcomes and while dealing with irregularity in the spelling system. In his seminars he helped the participants design studies which will provide the scaling information necessary to design beginning reading instruction.

Dr. Gene V. Glass, who has earned considerable respect for his work in evaluation and research design, concentrated his instruction on the design of experiments having both internal and external validity and on the selection of appropriate analyses. He also gave considerable attention to the logic underlying experimental analysis.

Dr. John R. Bormuth dealt with three topics. First, he outlined the theoretical and methodological problems involved in attempts to rigorously represent and then analyze the cognitive processes involved in language comprehension. He presented some of the results of his work in developing rigorous descriptive devices. He also discussed theory and research methodology in readability and research in syntactic complexity.

Dr. S. Jay Samuels discussed theory and research methodology in the experimental analysis of word recognition behaviors. He outlined the areas in which study should be conducted and illustrated, drawing on his own work, how this research could be carried out.

Dr. Kenneth Goodman presented quite a different approach to the analysis of word recognition behaviors. In his work he attempts to construct a model of the word recognition process by correlating miscues the child makes while reading with the language in the text and the language habits of the reader. He presented his research methodology and discussed its advantages and limitations.

The presession was held at the Abbey, a resort hotel on Lake Geneva in Wisconsin. This site was selected because it isolated the participants from the distractions of a large metropolitan area and threw the participants together into a close association throughout the conference. At the same time it offered an indoor swimming pool and enough other recreational facilities to provide a modest amount of diversion for the participants. This facility achieved both of its intended objectives, and aside from a few problems in room reservations and room ventilation, it provided comfortable, convenient, and pleasant accommodations.

PARTICIPANTS

Dr. Ira E. Aaron
Professor of Education
College of Education
University of Georgia
Athens, Georgia

Dr. Wilbur S. Ames
1311 Robert Ray Drive
Columbia, Missouri 65201

Dr. Rita Elizabeth Bergman
Ashland College

Dr. Mary T. Berry
Middle Tennessee State University

Sister Masseo M. Blesius
Winona State College

Dr. Emery P. Bliesmer
Director, Clinical Reading
Pennsylvania State University
103 Educational and Psychology Center
Building 11
University Park, Pennsylvania 16802

Dr. W. Archie Blount
Winston-Salem State College

Dr. Helen V. Bonnema
Temple Buell College

Dr. Beatrice J. Boose
Virginia State College
Norfolk Division

Dr. Jean G. Boyce
SUNY

Dr. Mari J. K. Brown
DePaul University

Dr. A. Byron Callaway
College of Education
University of Georgia
Athens, Georgia 30601

Dr. Donald T. Cannon
Creighton University

Dr. Bartell W. Cardon
Assistant Professor
School Psychologist
Penn State University
119 EPC 11, University Park, Pa. 16802

Dr. Jane H. Catterson
University of Saskatchewan

Dr. Jean I. Caudle
Professor of Education
Wisconsin State University
800 Algoma Blvd
Oshkosh, Wisconsin 54901

Sister Josephina Concannon
Boston College

Dr. Ruth C. Cook
Mankato State College

Dr. Robert K. Cornell
Southwest Regional Laboratory
Inglewood, California 90304

Dr. Kay S. Earnhardt
Emery University
Atlanta Public Schools

Dr. Robert L. Emans
Associate Professor of Curriculum
and Instructions
Temple University
Philadelphia, Pennsylvania 19122

Dr. Joseph L. Fearing
University of Houston

Sister Mary Julitta Fisch
O.S.F.

Dr. Margaret M. Fleming
Supervisor, Bureau of
Educational Research
Cleveland Public Schools
1380 E. 6th Street
Cleveland, Ohio 44114

Dr. Flora Fowler
East Tennessee State University

Dr. Edith M. Gifford
Assistant Professor of Education
Oregon State University
Corvallis, Oregon 97331

Dr. William L. Goodwin
Bucknell University
Lewisburg, Pennsylvania 17837

Dr. Herbert M. Haffner
Livonia Public Schools

Dr. James W. Hall
Northwestern University

Dr. James R. Hengoed
Assistant Professor
School of Education
Boston University

Dr. Ruth Virginia Hintsalo
Northern Michigan University

Dr. Roderick A. Ironside
Educational Testing Service
Princeton, New Jersey

Dr. Robert B. Kane
Associate Professor
Purdue University
West Lafayette, Indiana 47907

Dr. Ethel M. King
Professor, University of Calgary
Calgary Alberta, Canada

Dr. Thelma M. Kloempken
Winona State College

Dr. David W. Knight
University of Southern Mississippi

Dr. Pose M. Lamb
Purdue University
West Lafayette, Indiana 47906

Dr. Alma A. Leadbeater
Abington School District

Dr. Edith Levitt
Columbia University
New York, N.Y.

Dr. Janet E. Lieberman
Hunter College
City University of New York

Dr. Alvin J. Lowe
Assistant Professor
University of South Florida
Tampa, Florida 33620

Dr. Alan E. Maber
Union Free School District

Dr. George E. Mason
Associate Professor
University of Georgia
Athens, Georgia 30601

Dr. William J. Massey
Homewood School and
Bowie State College

Dr. William B. McColly
University of South Carolina

Dr. Edward P. Merryman
Missouri University at St. Louis

Dr. Wilma H. Miller
Wisconsin State University
La Crosse, Wisconsin

Dr. Roland A. Montambeau
Livonia Public Schools

Dr. Lorraine L. Morgan
Chatham College

Dr. Shirley D. Myers
Glynn County Schools

Dr. Jeanne R. Nurss
Emory University

Dr. Gus P. Plessas
Sacramento State College

Dr. James A. Poteet
Lincoln School
814 North 14th Street
Lafayette, Indiana 47904

Dr. Joseph W. Quinn
Coordinator
Pupil Personnel Services
Calgary Separate Schools
Calgary, Alberta, Canada

Dr. Wallace Z. Ramsey
University of Missouri at St. Louis

Dr. Ned H. Ratekin
University of Northern Iowa

Dr. Jean E. Robertson
University of Alberta

Sister Marie Colette Roy
O.S.F.
The Cardinal Stritch College

Dr. William D. Rutherford
University of Chicago
Chicago, Illinois

Dr. David B. Ryuckman
University of Michigan

Dr. Adrian B. Sanford
President, Educational Development Corporation
200 California Avenue
Palo Alto, California 94306

Dr. Antusa P. Santos
Mankato State College

Dr. Bickley F. Simpson
Lesley College

Dr. Hazel D. Simpson
Associate Professor
College of Education
Baldwin Hall
University of Georgia
Athens, Georgia 30601

Dr. June J. Slobodian
Livonia Schools
Madonna College
Eastern Michigan University

Dr. Marjorie S. Snyder
Child Study Center
Kent State University
Kent, Ohio

Dr. Doris M. Stampe
Ferguson-Florissant School District
University of Missouri

Dr. Laurel N. Tanner
Hunter College
University of New York

Dr. Jane W. Torrey
Connecticut College
New London, Connecticut

Dr. Yancey L. Watkins
Murray State University

Dr. Debrah M. Weiss
Ontario Institute for Studies
in Education

Dr. Joanna P. Williams
University of Pennsylvania
Philadelphia, Pennsylvania

SCHEDULE OF ACTIVITIES

AERA Presession on Research in Reading Instruction
February 2 - 7, 1968

Time	Saturday	Sunday	Monday	Tuesday	Wednesday
from 7 a.m.[1]	MDR[2] Breakfast	MDR Breakfast	MDR Breakfast	MDR Breakfast	MDR Breakfast
9 a.m. - 12 a.m.	RT[2] Organization Phonology (Venezky)	RT Research Design (Glass)	RT Research Design (Glass)	RT Analysis of Reading Errors (Goodman)	RT Research Design (Glass)
12 a.m. - 1 p.m.	MDR Lunch	MDR Lunch	MDR Lunch	MDR Lunch	MDR Lunch
1 p.m. - 4 p.m. (except Wed. 1 - 3 p.m.)	RT Analysis of Spelling to Sound Translation (Venezky)	RT Grammar (Venezky)	RT Comprehension (Bormuth)	RT Experimental Analysis of Word Recognition (Samuels)	RT Evaluation 3 - 3:30 Buses depart for Chicago
4:30 - 6 p.m.	Sandbar Cocktail Hour[3]			RT Cocktail Hour	
6 p.m. - 7 p.m.	Sandbar Dinner	MDR Dinner	MDR Dinner	MDR Dinner	
7:15 p.m. - end	RT Design of Word Recognition Curricula (Coleman)	Seminars[4] Venezky - DA Coleman - DB Glass - RT1 Bormuth - RT2	Seminars[4] Coleman - DB Glass - DA Bormuth - RT	Seminars[4] Goodman TB1 Samuels - TB2 Coleman - DB Glass - DA Bormuth - RT	

Schedule Footnotes

[1] The Main Dining Room is open for breakfast from 7 a.m. Please allow sufficient time for breakfast so that you will be on time for the 9 a.m. daily session.

[2] Rooms mentioned are:
MDR - Main Dining Room
RT - Round Table Meeting Room (in 2 sections for Seminars)
Sandbar - Sandbar
DA - Delavan Meeting Room A
DB - Delavan Meeting Room B
TB 1 - Tour de Bois, 1st Level
TB 3 - Tour de Bois, 3rd Level

[3] We will have cocktail hours on Saturday and Tuesday afternoons from 4:30 to 6 P.M. There will be a cash bar.

[4] There will be seminars following dinner on Sunday, Monday, and Tuesday evenings. You may go to the same seminar each evening or attend different seminars each evening. Details will be announced during the daytime sessions.

MATERIALS UTILIZED DURING PRESESSION

I. Materials mailed to participants

  A. First mailing to participants, included:
    1. First letter to participants
    2. Description of Presession in Reading Instruction
    3. Background questionnaire
    4. Postcard questionnaire
    5. Brochure on The Abbey

  B. Follow-up on first letter to participants

  C. Second mailing to participants, included:
    1. Second letter to participants
    2. Tentative schedule
    3. Bus schedule
    4. Bus preference
    5. Roommate preference
    6. Roster of participants (see part 1 of materials)

II. Materials handed out

  A. Schedule for lectures by Glass, Gene Glass, 1 p., schedule of Glass' lectures (he was ill for final lecture)

  B. Notes on Sources of Internal and External Experimental Invalidity, Gene Glass, 6 pp., description of Campbell and Stanley's sources of internal invalidity and Bracht and Glass' sources of external invalidity.

  C. Illustrations of Sources of Internal Invalidity, Gene Glass, 2 pp., examples for No. B. (above).

  D. The Doman-Delacato Rationale: A Critical Analysis, Melvyn P. Robbins and Gene V. Glass, 43 pp., critique of Doman-Delcato's theory on the relationship between neurological organization and reading.

  E. A Critique of Experiments on the Role of Neurological Organization in Reading Performance, Gene V. Glass and Melven P. Robbins, 38 pp., critique of research designs of studies on Doman-Delacato theory.

  F. The External Validity of Comparative Experiments in Education and the Social Sciences, Glenn H. Bracht and Gene V. Glass, 40 pp., discusses sources of external invalidity in comparative experiments.

  G. The Experimental Unit and the Unit of Statistical Analysis: Comparative Experiments with Intact Groups, Gene V. Glass, 8 pp., discussion of appropriate experimental unit and unit of statistical analysis.

H. Comprehension Bibliography, John R. Bormuth, 7 pp., bibliography of sources on language comprehension.

I. Summary of "On the Development of a Theory of Comprehension Instruction," John R. Bormuth, 2 pp., discussion of requirements for a theory of language comprehension, requirements for the task of teaching and measuring the language comprehension processes.

J. Tables Accompanying "On the Development of a Theory of Comprehension Instruction," John R. Bormuth, 20 pp., tables for No. I.

K. Collecting a Data Base for an Educational Technology, #2, Rank-ordering Word Classes According to Response Availability, E. B. Coleman and T. C. Potter, 12 pp., discusses rank-ordering word classes accordint to their response availability.

L.* Effects of Different Kinds of Visual Discrimination Training on Learning to Read Words, Ethel M. King, 9 pp., Compared kindergarten words learning to read 4 words following different kinds of visual discrimination.

M. Variables in Early Discrimination Learning: I. Motor Responses in the Training of A Left-Right Discrimination, Wendell E. Jeffrey, 7 pp., studies the transfer effect from learning a discriminative motor response to the more difficult labeling task.

N. The Orienting Reflex and Attention in Cognitive Development, Wendell E. Jeffrey, 17 pp., Discussion of previous research.

O. Writing as Pretraining for Association Learning, Harry Levin, John S. Watson, and Margaret Feldman, 4 pp., tested effects of writing as pretraining for association learning.

P. Recent Research in Visual Discrimination: Implications for Beginning Reading, Siegmar Muehl and Ethel M. King, 15 pp., discusses kinds of training that are most effective in helping children learn to discriminate among graphic patterns.

Q. The Effects of Visual Discrimination Pretraining on Learning to Read A Vocabulary List in Kindergarten Children, Siegmar Muehl, 5 pp., studied the types of sensory experiences which facilitate visual discrimination among printed words occurring in a reading task.

R. The effects of Letter-name Knowledge on Learning to Read a Word List in Kindergarten Children, Siegmar Muehl, 6 pp. , studied the effects of learning letter names on the subsequent acquisition of word name associations.

S. The Effect of Attention and Motor Response Pretraining on Learning to Discriminate B and D in Kindergarten Children, Lois N. Hendrickson and Siegmar Muehl, 6 pp., compared 3 treatment groups of kindergarten children learning names for the letters "b" and "d".

* L through S were mailed to participants to be read before the presession.

T. The Effect of Word Associations on the Recognition of Flashed Words, S. Jay Samuels, 3 pp., tables to accompany lecture.

RESULTS OF STAFF QUESTIONNAIRE

AERA 1968 Research Training Presessions Program

Presession Critique for Staff Members
(For Directors, Instructors and Assistants)

Percent

Indicate your observation and judgment by checking each item in one column at the left. Items not applicable or not subject to your observation should be omitted. Be frank.

Commendable	Satisfactory	Unsatisfactory	?	
				1. Environmental conditions
33	67	0	0	a. Classroom spaces
40	60	0	0	b. Work spaces
67	33	0	0	c. Living quarters
33	67	0	0	d. Teaching equipment, aids (chalk boards, public address system, etc.)
20	60	0	20	e. Resource material, library
33	33	33	0	f. Eating facilities
				2. Participants
33	67	0	0	a. Appropriateness of academic backgrounds
0	67	33	0	b. Sufficiency of research experience
83	17	0	0	c. Willingness to work
83	17	0	0	d. Intellectual curiosity
67	33	0	0	e. Concern for applicability of techniques
40	20	0	40	f. Aspiration
0	60	20	20	g. Immediate preparation for Presession
				3. Organization
83	17	0	0	a. Adequacy of notice to prospective applicants
100	0	0	0	b. Sufficiency of preplanning
83	17	0	0	c. Smoothness of operation
67	17	17	0	d. Adaptability to obstacles and feedback
60	40	0	0	e. Sensitivity to grievances
60	20	20	0	f. Adequacy of financial support
				4. Schedule
40	60	0	0	a. Appropriateness of five days for the job
83	17	0	0	b. Time spent efficiently
50	50	0	0	c. Events sequenced appropriately
67	33	0	0	d. Punctuality
67	33	0	0	e. Balance between formal, informal affairs
80	20	0	0	f. Quantity of discussions
40	40	20	0	g. Quality of discussions
60	40	0	0	h. Quality of formal presentations
50	50	0	0	i. Unobtrusiveness of evaluation efforts
40	60	0	0	j. Methods of evaluation

5. Outcomes

80	20	0	0	a. Intended content was actually taught
100	0	0	0	b. Increase in participant understanding
60	40	0	0	c. Improvement in attitude toward research
80	20	0	0	d. Personal associations initiated
				1 Many people indicated plan to continue contact

6. In general was the Presession well organized?
Yes - 100% No - 0%

7. Were the facilities suitable for the activities which you had planned? If not, specify.
Yes - 100% No - 0%

8. Should Presessions be limited to the same hotel, or the same city, in which the annual meetings will be held?
Yes - 0% No - 100%

9. Were you to do the same assignment over, in what major ways, if any, would you change your contribution?
1-Not predictable at the time
1-More selective in admitting applicants
1-Cover fewer research studies
1-Concentrate more on research studies

10. Do you wish that the Director had made firmer arrangements to assure participants and you of the staff opportunity to meet in pairs or small groups?
Yes - 0% No - 100%

11. Were the objectives you set for yourself during the Presession attained?
Yes - 83% No -17%

12. Are you inclined to urge your colleagues to become staff members for such an institute or Presession?
Yes - 100% No - 0%

13. In what ways, if any, did you as a staff member benefit personally as a result of your participation in this Presession?

2-I learned a great deal from both the other instructors and the participants.
1-I enjoyed the opportunity to meet more of the people who are doing research in reading.
1-I found new direction for my research.
1-I met colleagues with interest in same topics - both professional and personal relationships.
1-Sounding board, potential cooperative research contacts.
1-This staff participation was seen as a prestigious activity- and a little status makes people regard ideas with respect.

I gained a better appreciation than I had previously for the educational researcher -- reading specialist and her (his) problems and limitations.

1-I met many interesting people. The Presession offered me another opportunity to look at my own work in preparation for presenting it to the group.

It wasn't to my benefit to be away from campus so long at the beginning of second semester--I'm still trying to catch up.

RESULTS OF PARTICIPANT QUESTIONNAIRE

AERA 1968 Research Training Presessions Program

Participant Evaluation Form

Percentage of Responses

Indicate your observation and judgment by checking each item in one of the indicated (underlined) columns at the left. Do not make a mark in a column where an X appears. Your frank and honest evaluation can only benefit everyone concerned. Do not identify yourself by name unless you prefer to do so.

Environment and Facilities

Commendable	Satisfactory	Unsatisfactory	Yes	No		
21	54	25	XX	XX	1. a.	How satisfactory was the relative availability of books and journals in promoting your attempts to master the content of this session?
44	44	12	XX	XX	b.	How satisfactory were the reproduced materials given to you by the staff in promoting your attempts to master the content?
XX	XX	XX	80	20	2. a.	Did you feel that you had enough space to work, either alone or in small groups?
XX	XX	XX	88	12	b.	Was your room satisfactory?

3. a. Mark with a plus(+) those features of the meeting rooms and facilities of The Abbey which facilitated learning and with a minus(-) those features which were inadequate or not conducive to learning:

+	-	
75	21	___ Time schedule
83	12	___ Classroom spaces
25	75	___ Ventilation in classrooms
54	42	___ Temperature of classrooms
79	17	___ Acoustics in classrooms for hearing lecturers
79	17	___ Acoustics in classrooms during discussions
75	8	___ Classroom size (if negative) too large ___ too small ___
58	33	___ Space to spread out materials during sessions
39	58	___ Chalkboards
67	25	___ Electronic teaching aids
71	25	___ Ability to see lecturers
83	8	___ Lack of competing attractions (as in a city)
79	8	___ Attraction of Abbey's recreational features

b. Additional features (indicate whether positive or negative):

(Abbey's recreational features facilitated learning since they were quite unsatisfactory.)
(Room ventilation poor -- hard to control temperature)

(Schedule too tight to relax at all.)
(Half-day free about Mon. p.m. would give time to take advantage of recreation in area -- e.g. U. of Chicago observatory.)

Too long	Adequate	Too short	Yes	No			Scheduling and Organization
25	71	0	XX	XX	4.	a.	Appropriateness of five days as the length of time to leave your work at home for the purpose of attending this session.
8	67	21	XX	XX		b.	Appropriateness of five days as the length of time to learn much of the content of this session.
17	79	0	XX	XX	5. (?)	a.	Appropriateness of the length of the individual lectures.
XX	XX	XX	75	21	4	b.	Were the lectures scheduled in an appropriate sequence? (what sequence)
XX	XX	XX	71	25	6.		Did you have sufficient opportunities to interact with other participants?
XX	XX	XX	79	17	7.	a.	Was the time spent efficiently?
XX	XX	XX	79	17		b.	Were the instructors sufficiently accessible and approachable for you to get the individual attention that you desired?
XX	XX	XX	88	8		c.	Was it helpful to have graduate student assistants present? (The were magnificent.)
XX	XX	XX	79	21	8.		Were the attempts to evaluate your progress and reactions during the session (and at this moment) conducted so as to avoid interference with your work here?
XX	XX	XX	88	12	9.		In general, was the Presession well organized? (Very)
More	Same	Less	Yes	No			
0	54	46	XX	XX	10. (?)	a.	Amount of time which you had to pursue activities of your own choosing.
XX	XX	XX	46	46	8	b.	Did you like meeting in the evening after dinner?
0	62	25	XX	XX	8	c.	Should the number of meetings per day have been different?

Content and Presentation

More	Same	Less	Yes	No			
					11.	a.	Did the content of the lectures and readings in each of the following areas presuppose previous training different than that which you had?
12	75	8	XX	XX			Previous reading research studies
8	71	21	XX	XX			Word recognition
25	58	17	XX	XX			Comprehension
58	38	8	XX	XX			Linguistics
29	50	29	XX	XX			Research design (at too low a level)
21	54	17	XX	XX			Evaluation of instructional programs
12	58	12	XX	XX		b.	This amount of training in these areas should have been presupposed. (One-sided presentation of language as "out there" -- Goodman helped to counterbalance.) (Many didn't understand Glass' presentation.)

(Most presentations satisfactory.)

	Commendable	Satisfactory	Unsatisfactory	Yes	No			
	21	50	12	XX	XX	12.		To what extent was the content of the lectures and readings relevant to what you hoped to accomplish during the session?
17	38	54	0	XX	XX	13.	a.	Lectures were stimulating and interesting (Goodman, Samuels, Venezky)
17	50	42	0	XX	XX		b.	Lecturers were competent to speak on the subjects assigned to them.
8	42	50	0	XX	XX		c.	Lecturers were well prepared (Goodman good)
	12	62	17	XX	XX		d.	Seminars were successful (Some)
	12	58	17	XX	XX		e.	Discussions were successful (Some)
	XX	XX	XX	62	8	14.	a.	Were you satisfied with the group of participants?
(?)							b.	List the reasons for any disapointment, if you wish: (see attached sheet)
4	XX	XX	XX	83	8	15.		If you had it to do over again, would you apply for this Presession which you have just completed?
	XX	XX	XX	83	12	16.		If a presession such as this is held again, would you recommend to others like you that they attend? (I'd like to come again myself
	XX	XX	XX	83	17	17.		Do you anticipate maintaining some sort of contact with at least one of the Presession staff?
	XX	XX	XX	92	0	18.		Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one?
4	XX	XX	XX	17	75	19.		Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment?

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(?)	Commendable	Satisfactory	Unsatisfactory	Yes	No	
8	21	62	4	XX	XX	20. How successful do you think the Presession has been in accomplishing the staff's objectives?
8	42	46	4	XX	XX	21. Do you think your understanding of reading theory and research has been enriched in these five days?
8	XX	XX	XX	75	17	22. Do you plan to conduct a research study in the field of reading soon?
4	XX	XX	XX	67	17	23. Was the study you plan to conduct influenced by what you learned this week?
	XX	XX	XX	58	25	In design?
	XX	XX	XX	54	29	In objectives?
	XX	XX	XX	58	21	In basic concept?

All comments added by participants are in parentheses.

More responses to 3, b.:

(Committment re room facilities -- single room not available as promised for first two days.)
(Rooms were fine for a vacation, but need a desk and chairs for work.)
(Acoustics in rooms not conducive to study when adjoining rooms contain teen-agers.)
(No soap in room -- had to ask for soap.)

(Could have had more competent research in fields discussed by Coleman, Samuels.)

Comments on 8:

(Would like feedback.)
(I doubt that the exams are getting at achievement of primary objectives.)
(Too detailed -- many of the responses reflected previous knowledge far more than knowledge attained here.)
(Evaluation not really necessary or appropriate.)

Comments on 14, b.:

(Some participants had no background (or very little) in reading.)
(Some lecturers rambled.)
(Many participants seemed not to have appropriate backgrounds and were lacking a sense of humor.)
(Too many different needs, goals -- some persons requiring constant reinforcement.)

Comment on 20:

(Except for one general statement don't know what these were, objectives were never explicitly stated.)

SUMMARY AND RECOMMENDATIONS

The presession was well received by the participants. Almost one-fourth of the participants have written letters to the director expressing their satisfaction with the content of the presession and with the other arrangements. More than twice that number expressed similar sentiments directly to the director before leaving. Tabulations from the participants' questionnaires (which were filled out anonymously) seem to substantiate these observations.

I, the director, personally was pleased with the instructors and the participants. In retrospect, I do not believe I would design the same kind of presession if I were to set out again to train persons to do research in reading. I question whether it is possible in a five day period to accomplish such an objective. In order to perform high quality and significant research in reading instruction the researcher must have a good substantive background in linguistics, psychology, verbal learning, psychology of learning and cognition, and reading curriculum and instruction as well as a knowledge of research design. It might be realistic to think that one of these topics could be covered at an adequate level in five days. It might even be possible to instruct students in how that area of study is relevant to research in reading instruction, but to attempt to do more than that seems, after the fact, futile.

Given the same task over again, I would select just one of these substantive areas, say linguistics, give the students enough instruction in it to provide them with both a basic understanding of the discipline and a good idea of what further study they had to do, then I would devote the remainder of the session to showing how the theory and research methodology of that area can be used to perform research relevant to reading instruction.

In summary, the participants seemed well satisfied with the presession. But I believe their satisfaction stemmed from the rather heady stimulation one gets from encountering new and powerful approaches to some old and difficult problems, and I do not believe the participants were able to absorb enough organized knowledge in the brief amount of time available to enable them to materially improve their research. The instructors were well satisfied with their performances and for good reason -- it was uniformly excellent. But the director was quite dissatisfied with his design of the presession. He now believes that the topic of reading instruction is entirely too broad to permit work in sufficient depth to make any real difference in the participants' research behaviors. He recommends that, if there are any future presessions in the area of reading, the director should consider limiting the scope to a single research discipline and restrict admission to the presession to those who are otherwise competent to do research. This should be done even if it means eliminating all but 20 or 25 applicants.

PRESESSION II

EDUCATIONAL RESEARCH MANAGEMENT PROCEDURES

Director

Dr. Desmond L. Cook
The Ohio State University

INTRODUCTION

The purpose of this report is to present an evaluation of the activities carried out in connection with the 1968 AERA Presession on Educational Research Management procedures. The report is directed primarily to the Chairman of the 1968 AERA Presession Committee, Dr. Gene Glass of the University of Colorado, for his use in preparing a final report on all Presessions. This report is also directed to the participants in the Presession so that they might see the results of the evaluative scales that they completed during the final session of the total program.

Some of the evaluative materials have been summarized rather than presented in detailed form since the request made by the Presession Chairman focused primarily on such summaries. Certain other items have been included in the report, such as list of handout materials of which the participants already have knowledge, on the basis of the request from the Chairman of the AERA Presession Committee.

The report consists of four separate sections subsequent to this Introductory Section. The second section presents an outline of the Presession and includes items relating to the schedule, advanced materials, handout materials, participant characteristics, and a list of participants. The third section consists of summary reports of participant evaluation of the Presession. Included is a summary of the AERA Evaluation Sheet, the Institute Evaluation Form, and an evaluation of the management game developed by the Educational Program Management Center and used in connection with the Presession. The fourth section consists of an evaluation of the Presession on the part of the staff. This section consists of a summary of the individual staff reports prepared by the four staff members presenting instruction of the Presession along with summary remarks and recommendations by the AERA Presession Director. The final section of the report presents a summary of the total program.

PRESESSION OUTLINE

The Presession staff consists of four staff members. Two of the staff were full-time faculty of the members of the College of Education, The Ohio State University; the other two staff members were graduate students serving as Research Associates in the Educational Research Management Center, The College of Education, The Ohio State University. The participating staff members were as follows:

Dr. Desmond L. Cook = Director
Dr. Edwin Novak = Staff
Mr. Duane Dillman = Staff
Mr. William Loeber = Staff

The Presession schedule presented in Table 1 represents how the program was planned and is also a good representation of what was actually completed. The organization of this schedule reflected four general areas of instruction. The materials presented on Saturday were intended to provide a framework for the remaining material and provide a common orientation to the participants. The presentations schedule for Sunday and Monday focused on technique for planning a project and Tuesday's presentations focused on control techniques. The presentations on Wednesday were intended to tie together the previous concepts and also to present an introduction to the management of several projects. All material was presented with the exception of the first unit on Wednesday which was cancelled due to an unexpected illness of one of the Presession staff. Slight deviations from a specified time table occurred due to the unexpected complexity of certain simulation exercise materials but such deviations were at a minimum.

The advance literature was distributed with two objectives in mind. The papers by Cook (1) and Frederickson (3) were intended as supplementary materials to the lectures presented on the first day. The monograph by Cook (2) was the most important of the advance materials in that reading it would give the participant a better understanding of the management techniques presented in the second, third, and fourth days of the session. A bibliographical list of materials mailed out is presented below.

1. Cook, Desmond L., "The Use of Systems Analysis and Management Techniques in Program Planning and Evaluation", Symposium, Chapman College, Orange, California, 1967.

2. Cook, Desmond L., *Program Evaluation and Review Technique Applications in Education*, U. S. Government Printing Office, Cooperative Research Monograph Number 17, 1966.

3. Frederickson, Norman O., "The Administration of an Educational Research Program", 1966. Reprint from AERA Publication.

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Tentative Schedule

Saturday	Sunday	Monday	Tuesday	Wednesday
Administrative Details Presession Orientation	Project Definition a. System analysis b. Objective definition c. Work breakdown structure	Project Scheduling a. Time estimation b. Resource allocation	Control-Management Reports a. Characteristic of information systems b. Purpose of reports c. Requirements for management reports	Multi-Project Management P-P-B-S
Research Management a. Background b. Need for in education c. Kinds d. Overview	Planning a. Types of planning b. Network construction c. General Principles	Budget Preparation a. Allocation of costs to specific tasks	Control-Problem Analysis a. Problem analysis b. Decision making c. Potential problem analysis d. Recycling	Application of Management Systems to Educational R and D Situations
LUNCH				
Management and Management Systems a. Definition b. Management functions c. Types of systems d. Evaluation of project management systems	Simulation Exercise-Part I a. Introduction to Game b. Project definition c. Work breakdown structure d. Network constructure	Simulation Exercise-Part II a. Planned schedule b. Gross budget for project	Simulation Exercise-Part III a. Problem analysis b. Decision making c. Recommendations & alternative solutions	Organization for and implementation of Management Systems
Project Management and Project Selection a. Need & Nature of b. Placement c. Role of project manager d. Difficulties of project management				Summary Critique

The materials listed below were distributed during the Presession. They were intended to provide additional supporting information to lecture materials and also to provide alternative approaches to some of the concepts presented.

1. Cook, Desmond L., "Better Project Planning and Control Through the Use of Systems Analysis and Management Techniques", USOE Symposium, Washington, D. C., 1967.
2. Katzenbach, Jr., Edward L., "Program Budgeting for Sponsored Research", Paper presented at Joint Conference sponsored by American Council on Education and Johns Hopkins University in 1965.
3. Kaufman, Roger A. and Robert E. Corrigan, "What is the System Approach and What's In It for Administrators?", Symposium, Chapman College, Orange, California, 1967.
4. Meals, Donald W., "Heuristic Models for Systems Planning", Phi Delta Kappan, January, 1967.
5. The A, B, C's of PPBS. Reproduced from The Secretary's Letter, Volume 1, Number 3, Department of Health, Education, and Welfare, July, 1967.

Data regarding the participants by location or setting of their work, and major responsibilities in their work are presented in Table 2. Since several participants had more than one major responsibility and were possibly associated with more than one location, the frequency totals exceeded the total number of participants of the total group participants. Thirty-nine participants possessed the doctorate degree and 6 the master degree. There were forty-three men and two women at the presession.

A list of participants' names and addresses is presented as Appendix A to this report.

PARTICIPANT EVALUATION OF THE PRESESSION

A decision was made early by the staff in planning for the resession that any evaluation procedures centered around measurement of student achievement were basically inappropriate to the nature and purpose of the Presession. It was held that such sessions were devoted primarily to "up-dating" professional persons and that measurement efforts directed towards determining how much growth had taken place would work against the atmosphere desired by the Presession staff. As a consequence, no measures or instruments were developed which would assess growth. The evaluation procedures developed focused primarily upon securing feedback regarding the Presession itself and selected instructional materials. This section presents the results of these evaluations by the participants.

Table 2. Location and Responsibility of Presession Participants

Location / Responsibility	University	Public Schools	State Dept. of Education	Regional Lab.	R & D Center	Title III Center	Industry	f=
Project Director	9	2	6	3	1	1	1	23
Professor*	7*	-	3*	-	-	-	-	10*
School Administration	4	2	-	-	-	-	-	6
Research Coordinator	1	-	1	1	1	-	-	4
Program Specialist	-	1	1	-	-	-	-	2
Post-doctoral Research Fellow	1	-	-	-	-	-	-	1
Project Associate	-	-	-	-	-	1	-	1
Other Management Capacity	-	2	1	-	-	1	-	4
f =	22	7	12*	4	2	3	1	

*Three of the participants were located both in a university and State Department of Education.

The participant evaluation system for this presession consisted of three forms filled out by the participants at the conclusion of the presession. The three forms were treated as unrelated devices and no attempt was made to interrelate the results and formulate any broad generalizations. However, generalizations were drawn from the results of each separate evaluation form.

The Participant Evaluation Form was developed by AERA Presession Committee and was a standard form used by all presessions. It thus serves as a common basis for judging the effectivenessness of each Presession against all the others.

The Institute Evaluation Form, also used in the 1967 Presession, is less specific than the AERA Participant Evaluation and did not seek specific suggestions for improvement of the Presession. The participants were thus freer to criticize the Presession since they were under no obligation to offer alternative plans.

The third evaluation form used was the Management Game Evaluation. The Management Game was introduced in lieu of programmed exercises. It was hoped the game would not only encourage greater involvement but also allow the participants more flexibility in using their individual skills in solving management problems. The evaluation form was intended to elicit the participants' reactions to the strong and weak points of the game as a learning device.

A. AERA Evaluation Form

Over four-fifths of all the participants had high praise for the Presession in general. Following is a breakdown of specific facets of the Presession and the evaluation of these aspects by the participants.

1. Facilities. All but a few of the participants had some favorable comments on the facilities, but over three-fourths also mentioned that the rooms were too hot and stuffy most of the time. Features which were most frequently mentioned as conducive to learning were adequate size of the meeting rooms and the presence of round tables at the Session. Several participants mentioned that meeting rooms for the small groups should have all had a blackboard.

2. Scheduling and Length of Presession. The number and time of meetings was rated as excellent by over three-fourths of the participants, however several objected to the length of some of the meetings. Several participants also felt that the lectures (90 minutes) were too long. Over three-fourths, however, praised the competence and preparedness of the lecturers.

The participants were split on their evaluation of the length of the Presession itself (five days). Half felt that the Presession should have been condensed into a 3-4 day period, while the other half felt that five days was not too long to leave their work at home and attend the Presession.

It is interesting to note that although half of the participants would have preferred a shorter session, over 80 per cent stated that five days was not too long a period in which to learn much of the content of the Session. Several participants suggested mailing more content materials in advance and condensing the general information given during the first day.

3. Advance Materials and Content. All but one of the participants agreed that the advance materials that were sent out, especially the monograph and lecture handouts were quite helpful. Several participants suggested that many of the visuals be duplicated as handouts, thus cutting down on tedious note-taking.

Over four-fifths of the participants felt that the readings and lectures were relevant to what they hoped to accomplish and did not presuppose far more previous training than they had.

4. Interaction. Over three-fourths of the participants also praised the opportunities for interacting with other participants during the Presession. However, several participants stated that most of the interaction was within the same group with little inter-group interaction. About one-third indicated they will possibly collaborate on research with someone they met at the Presession; over over 90 per cent said they would maintain some sort of contact with at least one of the Presession staff.

5. Reaction to Staff All the participants with one exception, also had high praise for the cooperation and help from the staff. Several participants suggested that more direct attention by the staff to the small groups would strengthen the Presession even more. Over half also indicated that graduate assistants were helpful at the Presession but about one-fourth suggested that graduate assistants not be used as instructors.

B. Institute Evaluation

General participant response to the Institute was highly favorable. In summarizing the responses of the participants, a weighted scale was used. All questions were interpreted as being either favorable or unfavorable to the Institute. Five points were awarded to each strongly favorable response, 4 points to a favorable response and so forth with one point for strongly unfavorable responses. Using this system, responses to each question were totaled and then averaged. Table 3 presents a summary of participant responses to each statement.

A comparison of 1967 and 1968 Presession responses on this same instrument is shown in Table 4. A similar response pattern for each statement can be observed. However, 1968 scores were not as high as 1967 scores. Wide differences in program content make direct comparisons between the two sessions somewhat difficult but the marked similarity of response patterns does raise a question as to the value and usefulness of the instrument.

C. Management Game Evaluation

All but a few of the participants rated the administration, organization, and realism of the management game quite highly. Some participants suggested, however, that a general introduction as to how the games operate would be helpful.

Table 3. Summary of Responses on Institute Evaluation Form

Statements	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%
1. The purposes of the Institute were clear to me	10	24	24	59	3	7	4	10	0	0
2. The objectives of this Institute were not realistic	1	2	11	27	4	10	20	49	5	12
3. Specific purposes made it easy to work efficiently	0	0	24	62	8	20	5	13	2	5
4. The participants accepted the purpose of the Institute	3	7	19	46	13	32	5	12	1	2
5. The objectives of this program were not the same as my objectives	2	5	6	15	4	10	21	51	8	19
6. I didn't learn anything new	0	0	0	0	0	0	13	32	28	68
7. The materials presented was valuable to me	16	39	23	56	2	5	0	0	0	0
8. I could have learned as much by reading a book	0	0	2	5	9	22	23	56	7	17
9. Possible solutions to my problems were considered	1	2	18	45	7	18	12	30	2	5
10. The information presented was too elementary	1	2	5	12	7	17	23	56	5	12

Table 3. (Continued)

Statements	Strongly Agree f	Strongly Agree %	Agree f	Agree %	Undecided f	Undecided %	Disagree f	Disagree %	Strongly Disagree f	Strongly Disagree %
11. The instructors really knew their subject	10	26	18	47	5	13	3	8	2	6
12. I was stimulated to think objectively about the topics presented	7	17	25	61	7	17	2	5	0	0
13. New acquantances were made which will help in future research	7	17	24	59	7	17	3	7	0	0
14. We worked together as a group	9	22	19	54	4	10	9	22	0	0
15. We did not relate theory to practice	0	0	7	17	6	15	21	51	7	17
16. The sessions followed a logical order	3	7	28	68	4	10	6	15	0	0
17. The schedule was too fixed	3	7	3	7	6	15	27	66	2	5
18. There was very little time for informal conversation	1	2	5	12	2	5	26	63	7	17
19. I did not have the opportunity to express my ideas	0	0	3	7	0	0	30	73	8	20
20. I really felt a part of this group	4	10	27	66	5	12	5	12	0	0
21. My time was well spent	9	22	21	51	6	15	4	10	1	2
22. The Institute met my expectations	7	17	19	46	6	15	8	20	1	2

Table 3. (Continued)

Statements	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%
23. I received no guide for further action	0	0	1	2	2	5	30	73	8	20
24. To much time was devoted to trivial matters	2	5	10	24	7	17	12	39	10	25
25. The information presented was too advanced	0	0	2	5	4	10	23	56	12	29
26. The content presented was not applicable to the work I do	0	0	2	5	2	5	20	50	16	40
27. Institutes of the nature should be offered again in the future	20	49	18	44	3	7	0	0	0	0
28. Institutes such as this will contribute little to educational research and development	0	0	0	0	3	7	12	29	26	64

Table 4. Comparison of 1968 and 1967 Presession Institute Evaluation Form Responses

1967		1968	
Statement	Scale Value	Statement	Scale Value
1	4.54	1	3.98
2	4.31	2	3.41
3	4.06	3	3.22
4	4.10	4	3.44
5	3.90	5	3.78
6	4.67	6	4.68
7	4.56	7	4.34
8	4.02	8	3.85
9	3.60	9	3.02
10	3.96	10	3.71
11	4.58	11	3.54
12	4.48	12	3.90
13	3.88	13	3.85
14	3.25	14	3.68
15	4.35	15	3.68
16	4.21	16	3.68
17	3.85	17	3.54
18	3.58	18	3.80
19	3.98	19	4.05
20	3.65	20	3.73
21	4.42	21	3.80
22	4.10	22	3.56
23	4.31	23	4.10
24	3.83	24	3.44
25	4.50	25	4.10
26	4.27	26	4.15
27	4.77	27	4.41
28	4.71	28	4.56

Over half the participants requested either a less complex problem for the game or an introductory "canned" exercise.

There was wide disagreement among the participants concerning the time allotted for each session of the game. About three-fourths felt that the sessions were either too long (40%) or too short (60%). Several pointed out that the program definition and networking session and the budgeting session should be extended. It was also suggested that the problem and introductory material be distributed the night before for study. Several participants complained that the lecturing was too elementary and the sessions tended to drag toward the end unless the participants were all forced to think.

Over half the participants felt the information in the organization description and action memorandums was both clear and helpful, although a few suggested that it be more specific.

Almost all the participants indicated a low explication of the roles to be played but a good correlation between the game and the preceding instructional sessions. Several participants suggested, however, that the staff furnish more specific definitive information about the roles. It was felt that the staff did not fully provide for role-playing within each group.

The participants indicated a generally negative evaluation regarding the amount of feedback provided at the end of the game. Several suggested either allowing more time or increasing the size of the staff so that feedback could be given after each stage in the game. It was also suggested that a staff member or experienced participant be assigned to each group. It was felt that the lack of feedback as to how they were doing was the weakest point in the game.

Over half the participants thought the end products of each session were clear, but many pointed out that any lack of clarity was due to the complexity of the problem and lack of adequate time, thus keeping some groups from realizing their objectives.

A general summary of the evaluation would indicate a favorable response from the participants, with the exception of the comments noted above concerning the complexity of the problem, time factor, and amount of feedback from the staff.

SUMMARY OF STAFF REPORTS

Staff responses on the AERA Presession Critique for Staff Members were all satisfactory or commendable except for one unsatisfactory response concerning eating facilities. The staff felt that the objectives of the Presession were accomplished and that the participants gained an understanding of the material presented. A summary of staff critique is presented as Appendix B.

It was realized that the management game developed for this Presession needs revision. The material used, although taken from an actual situation, led to initial confusion and delay with regard to developing the required plan. This was not intended or anticipated and as a result subsequent portions of the game had to be kept less detailed than originally planned. Revision of the game is now in process.

Reorganization of general program content is not planned. However, the Presession did point out needs for minor revisions of lesson materials, visuals, and handout materials.

DIRECTOR'S REPORT

1. Preliminaries. Having conducted Presessions in both 1967 and 1968, it is felt that the early organization and finalization of Presession planning by Gene Glass was most beneficial to the preparation for the 1968 Presession. The early selection of Presession proposals and subsequent funding authorizations made it possible to select a staff well in advance and allowed adequate time for the development and organization of the presessions. Early site selection eliminated last minute problems in this area. The Presession Directors' meeting held in September was particularly helpful with regard to the above mentioned points as well as giving all Directors an opportunity to meet and agree on most administrative details.

The early organization of all Presessions also aided the local preparations. Presession staff members were able to be selected from the staff of the Educational Research Management Center at the Ohio State University which greatly facilitated coordination of the program development. In addition, the fact that four local staff members were available by means of the budget was of great value in planning and coordinating the instructional sequence and content.

2. Actual Presession. In general, the meeting room and living quarters were quite satisfactory. Of particular value was the large size of the room and the round table set-up which was well suited to small group work. The following problems were encountered.

(a) Room temperature was generally too high at the beginning of each day. It often took one or two hours before the hotel engineer could be obtained and a change made.

(b) The meeting room was used by another group during at least one evening, requiring collection and storage of teaching materials and equipment set up around the room.

(c) The room was poorly set up for use of an overhead and movie projector. A large portable screen was provided which was too low to be seen by all participants. Speakers were obliged to move back and forth from the podium in order to place visuals on the overhead projector. Speakers were also obliged to move away from the podium when talking extemperaneously and using the overhead. A portable microphone was of great value in these instances.

The presentations went as scheduled with a few minor exceptions. Progress in the management game exercise was slower than expected and certain portions had to be kept more general than planned. In addition, one of the senior staff members became ill on the last day and his final presentation was omitted.

The material mailed to participants in advance was meant to be read before attending the Presession. It was obvious by many of the questions asked that this had not been done by a fair number of participants. As a result, the staff is considering administering a pre-test at future sessions as a check on the value of advanced materials.

3. Recommendations. On the basis of both the 1967 and the 1968 Presessions, it is recommended that the Presession length should be the Director's prerogative as opposed to the present five-day module. Several participants favored a shorter but tighter schedule.

The application blank for the Presession tends to be too much oriented toward participants' possession of an experimental research background. This should be de-emphasized in favor of more general information which would be more pertinent to the wide variety of sessions conducted.

It would be helpful to know participant objectives for and expectations from attendance prior to their selection. This would enhance the selection process and possibly the program structure.

A general social hour at either the start and/or finish of all the Presessions is recommended to give participants from the several Presessions an opportunity to become acquainted.

SUMMARY

The composite reaction of participants and staff of the Presession was quite favorable. Suggestions for improvement were generally helpful and have been taken into consideration for future programs. Administrative procedures established by Gene Glass facilitated early planning and organization of the individual sessions. A list of major comments, recommendations, and conclusions appears below:

A. Presession Outline

1. The instructional schedule was followed with only minor deviations and all material was presented with one exception.

2. Advance materials did not appear to have been read by all participants and the staff is considering a pre-test for future sessions.

3. Participant job titles were quite varied and their locations represented a good cross-section of educational institutions.

B. Participant Evaluation

1. Positive comments centered on the practical value of the material presented.

2. Negative comments focused on the excessive heat in the meeting room and excessive length of certain lectures.

3. Comments on the management game centered on its difficulty and complexity for the time allowed.

C. Staff Evaluation

1. All staff members felt the objectives of the Presession were accomplished.

2. In comparing the 1968 Presession with the 1967 Presession, the Director felt that general organization was greatly improved.

3. The application blank for future Presessions should emphasize more general applicant background information and request a statement of applicant objectives for attendance.

APPENDIX A

1968 AERA Presession
Participant List

Dr. Roy D. Acker
Director of Research
Eastern Kentucky University
Richmond, Kentucky 40475

Dr. William H. Ashbaugh
Psychological Services and
Educational Research
Milwaukee Public Schools
Milwaukee, Wisconsin 53208

Dr. Gilbert R. Austin, Director
Bureau of Educational Research
and Testing Service
University of New Hampshire
Box Q
Durham, New Hampshire 03824

Dr. A. Edward Blackhurst
Special Education Instructional
Materials Center
University of Kentucky
641 South Limestone Street
Lexington, Kentucky 40506

Dr. George L. Brandon, Head
Vocational Education Department
250 Chambers Building
Pennsylvania State University
University Park, Pennsylvania 16802

Mrs. Marjorie B. Brodt, Director
Experimental Model School Project
200 Tranquil Avenue
Charlotte, North Carolina 28209

Dr. Roderick E. Chisholm, Director
Special Programs
St. Mary's College
Winona, Minnesota 55987

Mr. Richard T. Coffing
Assistant Dean, School of Education
University of Massachusetts
Amherst, Massachusetts 01002

Dr. John M. Coulson, Assoc. Director
Regional Planning Service
443 S. Gulph Road
King of Prussia, Pennsylvania 19406

Sister Crispin, Principal
Visitation High School
900 W. Garfield
Chicago, Illinois 60609

Dr. Floyd G. Delon
Associate Director of South
Central Regional Educational Lab.
302 National Old Line Building
Little Rock, Arkansas 72201

Dr. Neil S. Dumas
Social and Rehabilitation Service
University of Wisconsin
Madison, Wisconsin 53706

Dr. Norman D. Ehresman, Director
Center for Research in Vocational
and Technical Education
Box 8009, University Station
University of North Dakota
Grand Forks, North Dakota 58201

Dr. Joseph R. Ellis
College of Education
Northern Illinois University
De Kalb, Illinois 60115

Mr. Walter J. End
Coordinator of Research and Evaluation
Administration Annex S-502
Sixth Street North
West Palm Beach, Florida 33401

Dr. Eldon E. Fahs
Assistant to the President
Manchester College
North Manchester, Indiana 46962

Dr. Christopher W. Flizak
Department of Education
State University of New York
Fredonia, New York 14063

Dr. Douglas E. Giles
Supervising Principal
Lemon Grove Public Schools
Lemon Grove, California 92045

Dr. Tim Gust, Director
Research and Training Center
in Vocational Rehabilitation
University of Pittsburgh
Pittsburgh, Pennsylvania 15213

Dr. Jules Harcourt, Assistant Director
Michigan-Ohio Regional Educational Lab.
3750 Woodward Avenue
Detroit, Michigan 48201

Dr. Robert H. Hardy, Jr.
Program Specialist
Department of Program Development for
Gifted Children
Office of the Superintendent of
Public Instruction (Illinois)
Springfield, Illinois 26703

Dr. Jack H. House
Department of Educational Administration
Ontario Institute for Studies
In Education
102 Bloor Street, W.
Toronto 5, Ontario
CANADA

Dr. M. Frances Kelly
Department of Higher Education
State University of New York
Buffalo, New York 14222

Dr. Byron L. Kerns
Dean of Students
Millikin University
Decatur, Illinois 62522

Dr. Ralph E. Lundgren
Director of Educational Research
Office of the Superintendent
of Public Instruction
Springfield, Illinois 26703

Dr. Raymond C. Manion
H. R. B. - Singer, Inc.
P. O. Box 60
State College, Pennsylvania 16801

Dr. Guy Marion
2136 Chemin Ste-Foye
Quebec 10, P. Q.
CANADA

Dr. Donald Melger
Research and Development Center
for Teacher Education
University of Texas
University Station - Drawer J
Austin, Texas 78712

Dr. Nick F. Muto
Director, Title III
1200 Westmoreland Avenue
Syracuse, New York 13210

Mr. Larry R. Nelson
Director, Data Processing
and Analysis
Instructional Research Lab.
University of Wisconsin
Madison, Wisconsin 53703

Dr. John R. Noak
Assistant Director of Research
Office of Public Instruction
Springfield, Illinois 26703

Dr. O. K. O'Fallon
Director, Institute of Research
and School Services
College of Education
Holton Hall
Kansas State University
Manhattan, Kansas 66502

Dr. Glenn E. Reeling
Director of Institutional
Research
Jersey City State College
Jersey City, New Jersey 07305

Miss Barbara J. Rinker
Director of Research
I/D/E/A Office
Marine City-Ward-Cottrell High School
Marine City, Michigan 48039

Dr. Byron Keith Rose, Director
Northern California PACE Center
Chico State College
Chico, California 95926

Dr. J. Glen Scott
Office of the Coordinator
of Graduate Studies
Ontario Institute for Education
102 Bloor Street, W.
Toronto 5, Ontario
CANADA

Dr. Norval C. Scott, Jr.
Title III Center
662 La Mesa Drive
Salinas, California 93901

Dr. Alan T. Seagren
Coordinator of Laboratory
Experiences
Mid-Continent Regional Educational
Laboratory
University of Nebraska
Lincoln, Nebraska 68502

Dr. Richard L. Sheely
Assistant Superintendent of
Curriculum and Research
23305 Chagrin Blvd.
Cleveland, Ohio 44122

Mr. Denis Tanguay, Executive Secretary
Institute of Research in Education
Department of Education
917 Mgr. Grandin
Quebec 10, P. Q.
CANADA

Dr. Kenneth A. Tye
Specialist in Program Planning
Research Program I/D/E/A
1100 Glendon Avenue - Suite 950
Los Angeles, California 90024

Dr. Ralph E. Walker, Assistant
Superintendent
Research and Information Service
Unified School District #259
428 South Broadway
Wichita, Kansas 67202

Dr. Eldon L. Wiley, Executive Director
Southwestern Ohio Educational Research
Council, Inc.
1212 Oxford-State Road
Middletown, Ohio 45024

Dr. D. Parry Wilson
Director, Institutional Research
Weber State College
Ogden, Utah 84403

Dr. Edgar N. Wright
Director of Research
Toronto Board of Education
155 College Street
Toronto 28, Ontario
CANADA

APPENDIX B

AERA 1968 Research Training Presessions Program

Presession Critique for Staff Members
(For Directors, Instructors and Assistants)

Indicate your observation and judgement by checking each item in one column at the left. Items not applicable or not subject to your observation should be omitted. Be frank.

Commendable	Satisfactory	Unsatisfactory	
			1. Environment conditions
3	1		a. Classroom spaces
4			b. Work spaces
1	3		c. Living quarters
1	3		d. Teaching equipment, aids (chalk boards, public address system, etc.)
2	1		e. Resource material, library
	3	1	f. Eating facilities
			2. Participants
	4		a. Appropriateness of academic backgrounds
	4		b. Sufficiency of research experience
3	1		c. Willingness to work
2	2		d. Intellectual curiosity
3	1		e. Concern for applicability of techniques
3	1		f. Aspiration
	3		g. Immediate preparation for Presession
			3. Organization
2	2		a. Adequacy of notice to prospective applicants
2	2		b. Sufficiency of preplanning
2	2		c. Smoothness of operation
1	3		d. Adaptability to obstacles and feedback
	4		e. Sensitivity to grievances
1	3		f. Adequacy of financial support
			4. Schedule
1	3		a. Appropriateness of five days for the job
2	2		b. Time spent efficiently
2	1		c. Events sequenced appropriately
1	3		d. Punctuality
1	3		e. Balance between formal, informal affairs
2	2		f. Quantity of discussions
2	2		g. Quality of discussions
3	1		h. Quality of formal presentations
2	2		i. Unobtrusiveness of evaluation efforts
	4		j. Methods of evaluation
			5. Outcomes
2	2		a. Intended content was actually taught
4			b. Increase in participant understanding
2	2		c. Improvement in attitude toward research
3	1		d. Personal associations initiated

6. In general was the Presession well organized?

   Yes - 4

7. Were the facilities suitable for the activities which you had planned? If not, specify.

   Yes - 4

8. Should Presessions be limited to the same hotel, or the same city, in which the annual meetings will be held?

   Yes - 2
   No - 2

9. Were you to do the same assignment over, in what major ways, if any would you change your contribution?

   More discussion and application
   Develop more visuals
   Reorganize lesson material

10. Do you wish that the Director had made firmer arrangements to assure participants and you of the staff opportunity to meet in pairs or small groups?

    No - 3. They were quite adequate.

11. Were the objectives you set for yourself during the Presession attained?

    Yes - 4

12. Are you inclined to urge your colleagues to become staff members for such an institute or Presession?

    Yes - 4

13. In what ways, if any, did you as a staff member benefit personally as a result of your participation in this Presession?

    Experience in organizing such a session - 2 responses
    Experience in presenting materials
    Planning and development of a simulation exercise
    Personal contacts
    Better understanding of participant's problems and weaknesses of the Presession

PRESESSION III

ANTHROPOLOGICAL FIELD METHODOLOGY IN THE STUDY OF EDUCATION

Director

Dr. Frank W. Lutz
New York University

STAFF

Director:
Frank W. Lutz
School of Education
New York University
4 Washington Place
New York, New York 10003

Instructors:
Howard S. Becker
Northwestern University
Department of Sociology
Evanston, Illinois

Louis M. Smith
Washington University
St. Louis, Missouri

Laurence Iannaccone
School of Education
New York University
4 Washington Place
New York, New York 10003

Assistants:
Earl Gaulke
Graduate Assistant
Washington University
St. Louis, Missouri

John Erratt
56 Floral Terrace
Tenafly, New Jersey

William Hanigsbert
2040 Touhy Avenue
Chicago, Illinois

Lawrence Kaplan
65 Clover Lane
Lido Beach, New York

PARTICIPANTS

Doris Barclay
2234 N. Buenos Aires Drive
California State College at
Los Angeles
Covina, California

B. Dean Bowles
Department of Educational
Administration
University of Wisconsin
Madison, Wisconsin

Richard Brandt
203 Peabody Hall
University of Virginia
Charlottesville, Virginia

Helen Burchell
University of Pennsylvania
3700 Walnut Street
Graduate School of Education
Philadelphia, Pennsylvania

Emma M. Cappelluzzo
School of Education
University of Massachusetts
Amherst, Massachusetts

Courtney B. Cazden
Harvard Graduate School of
Education
Longfellow Hall, Appian Way
Cambridge, Massachusetts

Robert L. Curran
College of Education
928 N.W. 36 Road
University of Florida
Gainesville, Florida

Norman R. Dodl
Department of Elementary Education
College of Education
University of Illinois
Urbana, Illinois

Pat Erickson
431 Palmerston Boulevard
Ontario Institute for Studies in
Education
Toronto 4, Ontario

W. R. Fielder
Claremont Graduate School
Claremont, California

F. Lincoln Grahlfs
Sociological Resources for Secondary
Schools
503 First National Building
Ann Arbor, Michigan

Samuel Guskin
Indiana University
1725 East Hunter
Bloomington, Indiana

Frances F. Hanson
Portland State College
201 Old Main
Portland, Oregon

Robert W. Heller
State University of New York at Buffalo
4866 Kraus Road
Clarence, New York

Edward Hickcox
Ontario Institute for Studies in Education
102 Bloor Street West
Toronto, Ontario

Donald H. Kase
North Bay Pace Center
1005 Jefferson Street
Napa, California

Carl Lewis
State University of New York at Fredonia
Sociology Department
Fredonia, New York

William Lowe
Cornell University
Stone Hall
Ithaca, New York

Donald McCurdy
University of Nebraska
7901 E. Avon
Lincoln, Nebraska

Joseph McGivney
Ohio State University
9800 Kinnear Road
Columbus, Ohio

Troy McKelvey
State University of New York
 at Buffalo
6803 Tuscany Lane
East Amgherst, New York

Mary Meehan
Public Schools of Kansas City
5304 Troost
Kansas City, Missouri

Norma T. Mertz
Eastern Michigan University
307 Lafayette Towers East
Detroit, Michigan

Vernon Moeller
Department of Counselor Education
College of Education
Florida State University
Tallahassee, Florida

Norman Robinson
Faculty of Education
Simon Fraser University
Burnaby 2l, British Columbia
 Canada

Mary Rouse
Iowa Psychologist for Washington
 County Board of Education
Washington County Court House
Washington, Iowa

Monroe Rowland
IDEA
330 N. Main
Germantown, Ohio

Irvin Rubincam
Bucknell University
41 South Third Street
Lewisburg, Pennsylvania

Abilgail Sher
Yeshiva University
128 Fort Washington Avenue
New York, New York

Jay Smink
Department of Public Instruction
Box 911
Harrisburg, Pennsylvania

LaMar Sorenson
Salt Lake City Schools
440 E. First South Street
Salt Lake City, Utah

William Streich
Farmington Public Schools
8 Mountain Road
Farmington, Connecticut

Elwood Traylor
Wichita State University
2701 N. Pershing Court
Wichita, Kansas

Howard Van Sickle
Mankato State College
Mankato, Minnesota

R. A. Wallin
University of British Columbia
4620 W. 13 Avenue
Vancouver 8, British Columbia

Thurlow Wilson
City University of New York
535 E. 80 Street
New York, New York

Harry Wolcott
Center for Advanced Study of Educational
 Administration
University of Oregon
Eugene, Oregon

Frank Wood
University of Minnesota
103 Pattee Hall
Minneapolis, Minnesota

As indicated above the participants in this presession were quite a cross section. They ranged from those having long since completed their doctorates to those still working on it; from the west coast to the east coast and from Canada to Puerto Rico; from those having extensive experience in the methodology to those with none; from psychologists, anthropologists, and sociologists to curriculum specialists and educational administrators. Perhaps we were too prone to accept a cross section of those interested in studying education (too broad a category). We have suggested an alternative for future anthropological presessions.

SCHEDULE

The following schedule is the schedule actually followed in the presession. It will be noted that it differs from the tentative schedule first suggested. These modifications were made during staff meetings held after the completion of the sessions. They were based upon the feedback of the participants and represented the consensus of the staff. The Director feels the staff was very helpful in this regard and the resulting schedule was an improvement over the original one. Although there was the feeling on the part of some participants that the changes resulted in a lack of organization, this was not the case. The result was a better presession.

Actual Schedule

Saturday, February 3 12:00 - 5:00 p.m.

First Session (1:00-3:00 p.m.)

Large Group

A. An Overview of the Presession
30 min. - Lutz

B. Presentation of Work of Individuals
1) Smith - 30 min. (Classrooms)
2) Becker - 30 min. (Universities)
3) Iannaccone - 30 min. (Schools)
4) Lutz - 30 min. (Districts & School Boards)

BREAK

Second Session (3:15-4:30 p.m.)

Small Group

A. Each of us met with the four discussion groups for fifteen minutes to discuss and interact with groups concerning first session presentations.

Large Group

B. View Film, "The Conference", take no notes; write up for next day

Sunday, February 4 9:00 - 5:00 p.m.

Third Session (9:00-12:00 Noon)

Large Group

A. Discussions - What Happened in the Conference? (9:00-9:30)

B. The Conference with notes or interview materials. (9:30-10:00)

C. Data Collection-Analysis-Inference and Proof (10:00-11:00) - Becker

D. Can Field Studies Test Hypotheses? What is the Meaning of Field Data? (11:00-12:00 Noon) - Smith

LUNCH 12:00 - 2:00 p.m.	
	Fourth Session (2:00-5:00 p.m.)
Large Group	A. Verification (2:00-3:00) - Iannaccone
	B. Panel on above (3:00-3:30) Staff
Small Group	C. Use of scrambled cases (3:30-5:00)
Monday, February 5	9:00-5:00 p.m.
	Fifth Session (9:00-12:00 Noon)
Large Group	A. Discussions of scrambled cases (9:00-10:30)- Staff
Small Group	B. Staff's analysis of scrambled cases (10:30-12:00) - Smith & Iannaccone-A & B Lutz & Becker - C & D
LUNCH 12:00 - 2:00 p.m.	
	Sixth Session (2:00-5:00 p.m.)
	A. Roles in Field Data Collection (2:00-3:30) - Lutz
Small Group	B. Small Group Discussion (4:00-5:00)
Tuesday, February 6	9:00-5:00 p.m.
	Seventh Session (9:00-12:00 Noon)
Large Group	A. Tri systems model (9:00-11:00) - Lutz
Small Group	B. Small Group Discussion (11:00-12:00)
LUNCH 12:00 - 2:00 p.m.	
	Eighth Session (2:00-5:00 p.m.)
	A. Use of Interviews (2:00-5:00) - Becker
Wednesday, February 7	9:00-3:00 p.m.
	Ninth Session (9:00-12:30 p.m.
Large Group	A. Report Writing and the Morality Problem in Field Work (9:00-10:30)
Small Group	B. Informal Evaluation Discussions (10:30-12:00) - Staff
Large Group	C. Final Remarks (12:00-12:15) - Lutz and Staff

LUNCH 12:30 - 1:30 p.m.

Tenth Session (1:45-3:00 p.m.)

Discussion of kinds of research - Staff

1. Historic and Demographic
2. SES and social class
3. Reputational
4. Issue Analysis

Original Tentative Schedule

Saturday, February 3 12:00-5:00 p.m.

First Session (1:00-3:00 p.m.)

Large Group

A. An Overview of the Presession - 30 min.
Lutz

B. Presentation of Work of Individuals
Smith - 30 min. (Classrooms)
Becker - 30 min. (Universities)
Iannaccone - 30 min. (Schools)
Lutz - 30 min. (Districts & School Boards)

BREAK

Second Session (3:15-4:30 p.m.)

Small Group

A. Each of us meet with the four discission groups for twenty-minute periods to discuss and interact with groups concerning first session presentations.

Large Group

B. View film, "The Conference", take no notes; write up for next day

Sunday, February 4 9:00-5:00 p.m.

Third Session (9:00-12:00 Noon)

A. Data Collection - Analysis - Inference and Proof (9:00-10:00) - Becker

B. Discussions - What Happened in the Conference? (10:00-10:30)

Large Group

C. Can Field Studies Test Hypotheses? What is the Meaning of Field Data? (10:30-11:30) - Smith

Small Group	D. The conference with notes or interview materials (11:30-12:00)

LUNCH 12:00 - 2:00 p.m.

Fourth Session (2:00-5:00 p.m.)

Large Group	A. Roles in Field Data Collection (2:00-3:00) - Lutz
	B. Panel on above (3:00-3:30) - Staff
Individual Work	C. Use of scrambled cases (3:30-5:00)

Monday, February 5 9:00-5:00 p.m.

Fifth Session (9:00-12:00 Noon)

Small Group	A. Discussions of scrambled cases (9:00-10:00) - Staff
	B. Staff's analysis of scrambled cases with overhead materials (10:30-12:00)

LUNCH 12:00 - 2:00 p.m.

Sixth Session (2:00-5:00 p.m.)

Large Group	A. Field Studies - Verification Studies Continuum (2:00-3:00) - Iannaccone
Small Group	B. Small Group Discussion (3:00-5:00) Each instructor will have an opportunity to pursue their large group presentations with each of four groups for 25 minutes

Tuesday, February 6 9:00-5:00 p.m.

Seventh Session (9:00-12:00 p.m.)

Large Group	A. Tri-systems model (9:00-11:00) - Lutz
	B. Reanalysis of the scrambled cases by Tri-system (11:00-12:00) - Iannaccone

LUNCH 12:00 - 2:00 p.m.

Eighth Session (2:00-5:00 p.m.)

Large Group	A. Other Data Collection Methods (2:00-5:00) 1. Records-Historic-Demographic 2. SES and Class Models 3. Reputational 4. Issue Analysis 5. Field Experimentation

Wednesday, February 7 — 9:00-3:00 p.m.

Ninth Session (9:00-11:00 p.m.)

Large Group	A. Report writing and the morality problem in field work (9:00-11:00) - Panel

LUNCH 11:00 - 12:00 NOON

Tenth Session (12:00-3:00 p.m.)

	A. Evaluation (12:00-1:00) Form of Report Writing Theory and Models Data Collection Data Analysis Future Research and Verification Studies
Small Group	B. Informal Evaluation Discussion (1:00-2:00) - Staff
Large Group	C. Final Remarks (2:00-2:30) - Lutz and Staff

MATERIALS DISTRIBUTED

A. Twenty-two page bibliography of readings in descriptive research. This was very extensive and produced by Howard Becker.

B. Notes of an interview done by H. Becker during his "teacher mobility study" (16 pages). This was used as a basis of discussion of the interview techniques.

C. A scrambled case of 10 pages developed by L. Iannaccone from his Whittman school work. It consisted of paragraphs describing individual teachers in a school. This was used as a "data source" allowing the participants to "build" the social structure of the school and discuss their analysis with the staff.

D. The Tri-System Mode. A one-page graphic illustration of a model developed by F. Lutz from the work of Homans, Loomis, and General Systems, plus some of his own work. This served as a basis for a presentation on data collection and data analysis and a group discussion of problems related to the topic.

E. Tentative presession schedules and participant rosters were distributed.

RESPONSES TO PARTICIPANT QUESTIONNAIRE

Some of the questions of the questionnaire appeared to confuse the participants. For instance, "Was your room satisfactory" was answered by some using their sleeping quarters as a reference and others using their meeting room as a reference when answering the question. The Director encountered considerable difficulty in attempting to tabulate the more or less free response answers to the questionnaire. A checked response would probably have been easier and more reliable to respond to.

Participant Evaluation

Environment and Facilities

1 a. To what extent did the relative availability or unavailability of books and journals interfere with or promote your attempts to master the content of this session?

A Lot	A Little	None
1	12	26

b. To what extent did reproduced materials given to you by the staff improve matters?

A Lot	A little	None
12	20	3

2 a. Did you feel that you lacked a "place to work", whether alone or in small groups?

Yes	No	Indifferent
7	34	1

b. Was your room satisfactory?

Yes	No	Indifferent
31	6	1

3 a. Which features of the meeting rooms were inadequate or not conducive to learning.

Good	Bad	Indifferent
4	34	1

Scheduling and Organization

4 a. Was five days too long a period to leave your work at home for the purpose of attending this session?

Too Long	About Right	Too Short
20	22	

b. Was five days too short a period of time in which to learn much of the content of this session?

Too Long	About Right	Too Short
2	30	3

5 a. Were you allowed enough time in which to pursue activities of your own choosing?

Yes	No
35	4

b. Would you have preferred not to meet in the evening after dinner?

Did not meet in evening. The responses indicated it was the right thing to do.

c. Would you have preferred more or fewer meetings per day than there actually were? Or was the number of meetings per day agreeable to you?

Fewer or Shorter	More	OK
8	1	30

6 a. Were the individual lectures too long to sit and listen or take notes?

Yes	No	Occasionally
10	20	11

b. Were the lectures scheduled in an appropriate sequence?

Yes	No	Not sure
30	7	4

7 a. Did you have sufficient opportunities to interact with other participants?

Yes	No
30	6

8 a. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention that you desired?

Yes	No
2	37

b. Was it helpful to have graduate student assistants present?

Yes	No	Didn't know
16	20	2

9. Did the attempts to evaluate your progress and reactions during the session (and at this moment) interfere with your work here?

Yes	No
1	40

10. In general, was the presession well organized?

Yes	No	Fairly Well
23	6	8

Content and Presentation

11 a. Did the content of the lectures and readings presuppose far more previous training than you had?

Yes	No	Didn't Know or OK
1	39	

b. Should more or less training in these areas have been presupposed?

More	Less	Didn't Know or OK
10	6	12

12. Was the content of the lectures and readings relevant to what you hoped to accomplish during the session?

Yes	No	Sometimes or Usually
23	3	7

13 a. Were the lecturers stimulating and interesting?

All	Some or Most	Few or None
18	20	2

b. Were the lecturers competent to speak on the subject assigned them?

All	Some or Most	Few or None
32	8	1

c. Were the lecturers well prepared?

All	Some or Most	Few or None
29	9	2

14. Were you disappointed in any way with the group of participants?

Yes	No	Didn't Know
11	27	1

15. If you had it to do over again, would you apply for this presession which you have just completed?

Yes	No
11	8

16. If a presession such as this is held again would you recommend to others that they attend?

Yes	No	Didn't Know
31	8	1

17. Do you anticipate maintaining some sort of contact with at least one of the presession staff?

Yes	No	Didn't Know
27	12	2

18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one?

Yes	No
37	1

19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment?

Yes	No
2	32

20. Is it likely that you will collaborate in research with someone else attending this presession (other than those you already were likely to collaborate with)?

Yes	No	Perhaps
10	24	3

21. Do you think that the staff should feel that it has accomplished its objectives during this five-day presession?

Yes	No	Partially
28	4	5

PARTICIPANTS COMMENTS

In addition to the questionnaires supplied by AERA, we asked the participants to write a page indicating their feelings about this presession. The following paragraphs are taken from these comments. Generally the participants appeared satisfied with the presession. Most provided not only commendatory comments but also helpful suggestions. Some were openly critical of certain aspects or individuals.

For some the presession provided experiences which will directly influence their research. Comments such as, "...terribly helpful at this point in my own work", -- "I have been exposed to an area that I previously ignored", -- "I picked up many ideas for immediate and practical use in my own work", --"...may lead to some changes in research I am doing", "...this session will be useful for my research" --- indicated that the presession will influence research in education.

Other comments suggested possible improvements for future presession in anthroplogical methods. "The presession should assume a higher level of general intellegience" and "it may have been better to separate into two groups" express the correct notion that there were great differences in the amount of previous experience in the use of the methodology evidenced in the group. Perhaps a "team teaching" organization, using only a few sessions with the total group and two programs (one advanced and one beginning) based on the previous experience of the participant was needed. The suggestion made several times "data collection in the field could have proven valuable" indicates a need on the part of the less experienced participant. Comments like "some material too elementary" and "more penetration should have occurred" indicates a more experienced need for participants. Other comments like "interesting and informative session, but it did not serve my needs" and "some good and some bad", indicated the differing needs and experience of the participants.

Some comments were sharply critical of indidivual staff members. Each staff member was named as not being effective but each was also specifically named as being "the best in the session". Again the differences of the participants is pointed out. That the staff, through its diversity, was able to reach different participants is held to be an asset and was expressed by some participants -- "I felt that the staff was remarkably open and frand" -- "very competent staff" -- "well-balanced staff in terms of previous work and style of working with the group".

Finally most participants felt the presession had been a good one. The following quotes express such a feeling. Regarding the program --"I can't conceive of a more appropriate sequence" -- "highly stimulating" -- "very helpful session" -- "certainly worth attending" -- "well organized - the concepts discussed were of value" -- "great idea - especially as a counter to the general mood of AERA" -- "informative, interesting, helpful" -- "a very worthwhile five days". As to personal benefit, participants indicated, "the experience was rewarding and stimulating" -- "on the whole just what I wanted" -- "I received precisely what I came for". The above three paragraphs represent short excerpts from reports by participants. No two comments came from the same participant nor did most participants only praise or criticize. Most criticisms were very constructive. On the whole, these paragraphs represent the feelings of those participants (37 of 48) who wrote a comment page. These will prove very valuable in improving future presessions on anthroplogical methods should AERA approve such.

RESPONSES TO STAFF QUESTIONNAIRE

Staff Questionnaire*	Comm	Sat	Unsat
1. Environmental conditions			
a. Classroom spaces		3	5
b. Work spaces		7	1
c. Living quarters		8	
d. Teaching eqiupment, aids	4	4	
e. Resource material, library		6	2
f. Eating facilities		8	

*There were four instructors and four graduate assistants responding, thus a possibility of eight responses.

		Comm	Sat	Unsat
2.	**Participants**			
	a. Appropriateness of academic background		8	
	b. Sufficiency of research experience		8	
	c. Willingness to work		8	
	d. Intellectual curiosity	2	6	
	e. Concern for applicability of techniques	2	6	
	f. Aspiration		8	
	g. Immediate preparation for presession		6	2
3.	**Organization**			
	a. Adequacy of notice to prospective applicants		8	
	b. Sufficiency of preplanning		6	2
	c. Smoothness of operation		7	1
	d. Adaptability to obstacles and feedback	8		
	e. Sensitivity to grievances	8		
	f. Adequacy of financial support	6	2	
4.	**Schedule**			
	a. Appropriateness of five days for the job		7	1
	b. Time spent efficiently		7	1
	c. Events sequenced appropriately		8	
	d. Punctuality		8	
	e. Balance between formal, informal affairs		8	
	f. Quantity of discussions		8	
	g. Quality of discussions	1	7	
	h. Quality of formal presentations	2	6	
	i. Unobtrusiveness of evaluation efforts	5	3	
	j. Methods of evaluation	1	7	
5.	**Outcomes**			
	a. Intended content was actually taught	5	3	
	b. Increase in participant understanding	6	2	
	c. Improvement in attitude toward research	1	7	
	d. Personal associations initiated	4	4	

6. In general was the presession well organized?

   Generally "yes" -- but ability to get staff together before the presession would help a lot.

7. Were the facilities suitable for the activities which you had planned? If not, specify.

   Generally "yes" -- the hotel did what it could, but small group flexability was a hinderance to operation.

8. Should presessions be limited to the same hotel, or the same city, in which the Annual Meetings will be held?

   We had hoped to hold ours in the convention hotel for the convenience of the participants only to find a different presession hotel from regular session hotel. Why?

9. Were you to do the same assignment over, in what major ways, if any, would you change your contribution?

(See recommendations)

10. Do you wish that the director made firmer arrangements to assure participants and you of the staff opportunity to meet in pairs or small groups?

Some "Yes" --- Some "No"

11. Were the objectives you set for yourself during the presession attained?

All "Yes"

12. Are you inclined to urge your colleagues to become staff members for such an institute or presession?

All "Yes"

13. In what ways, if any, did you as a staff member benefit personally as a result of your participation in this presession?

All felt they benefited from the experience of interacting both with the participants and with other staff members.

EVALUATION

It was decided by the staff that mastery tests were not desirable in such a presession and we indicated in our proposal that none would be given. We followed this notion. Participants were given the opportunity to evaluate themselves and discuss their work in the following ways:

1. Field observation and note taking
2. Data analysis from field data
3. Analysis of interview data
4. Participants questionnaire
5. Informal, small group evaluation of the presession

From the above and the comments of the staff, the following suggestions are derived for future presessions in the anthropological method in education.

1. All the staff and many of the participants recommend that AERA continue to sponsor presessions in anthropological methods.

2. It has been suggested that Division D (Methodology) take some interest in the anthropological or descriptive methodology of educational research.

3. Any future attempt at such a presession should divide the total group into experience levels and research interests (i.e., administration, classroom, educational politics). They should then utilize staff election and team teaching methods in order to meet the varying needs of the participants.

   a) Field experience should be part of the beginners session

   b) Extensive share research should be part of the experienced session

   c) Both sessions should receive a "package" of before-session "homework"

4. A "happy hour" session should precede the actual presession.

5. Coffee breaks should be a planned part of the sessions (perhaps at a fee of $5 or $6 could be charged to cover cost of #4 and #5).

6. An individual whose formal course work trained him in anthropology should be included. (The four staff members had used the anthropological method extensively to study education. But none were trained as anthropologists.)

PRESESSION IV

NONPARAMETRIC METHODS AND RELATED POST HOC PROCEDURES

Director

Dr. Leonard A. Marascuilo
University of California at Berkeley

PRESESSION OBJECTIVES

The objectives of the Presession on Nonparametric Methods were stated in simple operational terms. They were designed to satisfy some of the needs of behavioral scientists whose duties included research in an educational setting and not in the development of new statistical procedures and methods. Since more and more educators are becoming involved in research and since the number of nonparametric methods available constantly increases, it becomes essential that active educators and behavioral researchers be informed and kept up to date on the advances made in this important area of research methodology. Consequently, this Presession was planned for researchers in education who had minimal backgrounds in statistics and was executed with their assumed needs in mind.

A printed statement of the primary goals and objectives of the Presession was made available to potential participants in the announcement "Call for Applications to the AERA 1968 Research Training Presessions" which appeared in the Educational Researcher. The specific announcement read as follows:

"The course content will be:

"Content and Objectives: The course content will be restricted to nonparametric techniques extensively used in education and the behavioral sciences. The first part of the course will treat nonparametric tests designed for qualitative variables, such as the Sign Test, the Median Test, and the Irwin-Fisher Exact Test. The second part of the course will emphasize nonparametric tests based on ranking procedures: the one sample Wilcoxon Matched-Pairs Test, the Wilcoxon Two Sample Test, the Krusal-Wallis extension of the Wilcoxon Test, the Friedman Test for Repeated Measures, and the corresponding post hoc procedures, as well as Spearman's Ranked Correlation Coefficient and Kendall's Coefficient of Concordance. The primary objective will be to assist the participants in applying the techniques of nonparametric statistics to the solution of problems of hypothesis testing and estimation commonly occurring in educational research.

"Anticipated Audience: This session will be open to persons whose responsibilities include the design of educational research studies and the analysis of research data. The course is primarily intended for educational researchers whose commitment is to substantive areas other than that of statistics."

Since the primary objective of the Presession was to assist the participants in applying the techniques of nonparametric statistics to the solution of problems of hypothesis testing and estimation commonly occurring in educational research, it was hoped that at the end of the presession the participants would be able to:

a. Explain to other researchers and educators the rationale behind the nonparametric tests commonly employed in behavioral research.

b. Select the "best" nonparametric test for a specific situation or experimental design in both laboratory and school settings.

c. Perform nonparametric tests on data collected in educational research studies of observational or experimental nature.

d. Conduct appropriate post hoc comparisons on hypotheses rejected by nonparametric procedures.

e. Apply and extend the nonparametric techniques learned to specific problems in educational research for which textbook examples are not available.

f. Read with understanding the current literature on nonparametric methods appropriate for research in education.

g. Read with understanding current education research studies and reports that use nonparametric statistics.

h. Direct other researchers in the use of nonparametric methods.

STAFF

The Director and his staff are as follows:

Director:

Dr. Leonard A. Marascuilo
Department of Education
University of California at Berkeley
Berkeley, California

Instructional Staff:

Dr. Maryellen McSweeney
School of Education
Michigan State University
East Lansing, Michigan

Dr. Douglas Penfield
Department of Education
University of California at Berkeley
Berkeley, California

Assistants:

Mr. Michael Subkoviak
School of Education
State University of New York at Buffalo
Buffalo, New York

Mr. Larry Leslie
Department of Education
University of California at Berkeley
Berkeley, California

The Director of the Presession selected his staff members from associates whose proficiencies and competencies in statistics and administration were well known from previous work and study experience.

Both instructors were, at one time, graduate students in the Statistics and Measurement Program under the guidance of the Director. Furthermore, both instructors had taken theoretical courses in Nonparametric Statistics in the Department of Statistics at the University of California at Berkeley. As a result, they were quite knowledgeable in the exciting and major advances in nonparametric methods that have taken place in that active department. Many of the new techniques which they had learned were presented for the first time to behavioral researchers at this Presession. In addition, both instructors, while graduate students, had considerable teaching experience in the statistics courses required of all Ed.D and Ph.D. candidates in the Department of Education at the University of California at Berkeley. Student reports on the quality of teaching performed by both instructors has always been of the highest kind. Thus, both staff members were selected because they were available, they were known to be excellent teachers, and they possessed an excellent grasp and understanding of the materials to be taught at the Presession.

The assistants were also selected on the basis of known competence. One of the assistants, who also conducted some of the Presession teaching, served as the Director's Teaching Assistant for a graduate course in Nonparametric Methods taught during the summer of 1967 at the State University of New York at Buffalo. His performance as a Teaching Assistant was excellent. The remaining assistant was selected because of his proven abilities as an administrator and coordinator of educational projects. He was known to the Director through a course that he took in Nonparametric Statistics taught by the Director at the University of California at Berkeley.

Without doubt, the Director's expectations concerning the performance of his staff during the Presession were well met. Each member of the staff performed at a level commensurate with their known proficiencies and competencies. Their skills were effectively used.

SELECTION OF THE PARTICIPANTS

Applications were received through the mail from Dr. Gene V. Glass of the University of Colorado. They were screened and evaluated by the Presession Director and Dr. Douglas Penfield of the Instructional Staff. Fifty-nine applicants were admitted to the Presession. Forty-nine actually attended. Criteria used for selecting the participants were as follows:

1. Doctorate. Following the advice of Dr. Gene Glass, it was decided that applicants not holding a doctorate would not be admitted since, in most cases, they would have had the opportunity to develop skills in nonparametric methods through regular doctoral programs at their local institutions. However, it was also recognized that many small schools and research agencies might not offer courses in nonparametric statistics and so consideration was also made for some students who did not hold a doctorate.

2. Formal training in statistics. Because of the level of instruction contemplated for the Presession on Nonparametric Methods, it was necessary to assume that every participant had training in statistics beyond a first course. Therefore, students who had had only one course were, generally, not admitted. In the announcements, never made available to potential participants, it was suggested that applicants should have familiarization with the binomial and hypergeometric distributions along with knowledge of the one-way analysis of variance and the related post hoc comparison procedures of Scheffé. Most of the participants who did appear for the Presession did not have this minimal training.

3. Estimate of potential to contribute to education research activities. While this was to be given considerable weight, it was not necessary, since it appeared that Criterion Two eliminated, on a self-selection basis, many researchers who would have applied but who would not have been accepted.

NOTIFICATION TO APPLICANTS OF THEIR ADMISSION TO THE PRESESSION

Applicants accepted to participate in the program were informed of their acceptance by means of the following letter sent them at the end of the Fall Quarter just prior to the Christmas vacation period:

> It is a pleasure to inform you that your application has been accepted to the AERA Presession on Nonparametric Methods. The presession is being held at the Chicago Sheraton between 8:30 a.m. on Saturday, February 3 to 5:00 p.m. on Wednesday, February 7. For this program the Sheraton has offered special rates for presession participants. In order to take advantage of these presession rates, it is advisable that you make hotel reservations as soon as possible. Since instruction will begin promptly at 8:30 a.m., it is suggested that you arrive at the Sheraton on February 2.
>
> The course will use as a text Distribution Free Statistical Text by James Bradly, which will be available for purchase at the first presession meeting. This test is a U.S. Department of Commerce publication and retails for approximately $3. In addition to the text, prepared handouts will be distributed to the participants.
>
> My staff and I will do all we can to make this presession match your expectations. We are looking forward to meeting you and of being given the opportunity to discuss mutual problems and research in education. If you have any questions regarding the presession, please write to me at Room 4511, Tolman Hall, University of California, Berkeley 94720.

DESCRIPTION OF THE PARTICIPANTS

Of the 59 participants admitted to the Presession, 49 appeared on the opening date. All 49 remained with the Presession throughout its duration. On the first day, following the first lecture, two participants felt that they were unprepared and asked to be shifted to another presession being held in the hotel at the same time. An unsuccessful attempt was made to transfer them. As a result, they remained with the group. In the end, they reported that they were pleased that they had not changed to another presession since they had gained new insights in statistics and nonparametric methodology which could be used in their own research and in the evaluation of the research of others.

The 49 participants who took part in the Presession are described in a summary of the biographical information collected on the application forms.

1. Sex of the Participants.

Sex	Frequency	Percent
Male	35	71
Female	14	29
	49	100

As might have been expected, the bulk of the participants were male.

2. Age of the Participants.

Age	Frequency	Percent
20-29	6	12
30-39	23	47
40-49	17	35
50 and over	3	6
	49	100

Most of the participants were under forty, which suggests that the potential for future research in the entire group is relatively high. It is also believed, though it is only a subjective feeling, that the younger members gained the most from the Presession. They seemed to be the most enthusiastic, the most questioning, and the most eager to learn and increase their knowledge of nonparametric methods.

3. Institutional Affiliation.

Type of Institution	Frequency	Percent
College or University	33	67
Research Center	10	20
Other	6	13
	49	100

Most of the participants held professorial positions at their respective teaching institutions. Some of them were responsible for the teaching of statistics and research design and planned to use what they learned in their teaching. A few of the participants were concerned with reading important research in their own areas of inquiry and felt that a knowledge of nonparametric statistics would help them in understanding and improving their own evaluations of what others have done and written.

4. Attendance at previous AERA Presession.

Previous Attendance	Frequency	Percent
Yes	14	29
No	35	71
	49	100

For most of the participants, this was a first exposure to AERA presessions. From their general comments, they seemed well satisfied and on the basis of this first experience were quite anxious to attend another presession on topics of personal interest, either next year or in the near future.

5. Years since Doctorate (for those who had Doctorate.)

Years	Frequency	Percent
1	5	14
2	3	8
3	9	24
4	1	3
5	6	16
6 to 9	8	22
10 or more	5	13
	37	100

Nearly 50% of the participants had obtained their doctorate in the past five years. This characteristic correlated with their relatively young ages. Since many of the participants reported that basic courses in statistical inference were poorly taught or not taught at all at the institutions where they earned their doctorate, it follows that Schools of Education are not adequately preparing their candidates for research. As such, it must follow that the presession program of AERA is of immense value and should definitely be continued and expanded.

6. Courses in Statistics.

Number	Frequency	Percent
1	5	10
2	11	22
3	14	29
4	8	16
5	2	4
6	9	19
	49	100

Since more than a beginning course in statistics was a requirement for admission, one might think that most participants would have been prepared or qualified to take this course. However, as was soon learned, number of courses is not a very satisfactory criterion variable for measuring understanding and sophistication. Unexpectedly, the class was quite heterogeneous and less homogeneous than planned for. Even though 68% of the participants had three or more courses in statistics, less than one-fourth knew of Scheffé's Theorem or Tukey's post hoc multiple confidence interval procedures, truly two of the most important procedures for behavioral research.

7. Allocation of duties between teaching and research (for those who responded to this item).

	Teaching		Research	
Amount of time	Frequency	Percent	Frequency	Percent
0% to 24%	5	16	6	13
25% to 49%	7	22	11	24
50% to 74%	9	28	9	20
75% to 100%	11	34	19	43
	32	100	45	100

It is quite interesting to note that 39 of the 49 participants spend more than 25% of their time in research, and yet their statistical training is clearly not sufficient for the research they are doing. Without doubt, this course was necessary for them, and perhaps even more important, it served to teach them more basic concepts in statistics than were expected either by the participants or by the instructional staff. It thus seems that more incidental learning occurred than was anticipated.

8. Articles Accepted in Refereed Journals.

Number	Frequency	Percent
0	21	43
1	6	12
2	9	18
3	3	6
4	1	2
5	1	2
6 or more	8	17
	49	100

More than 50% of the participants had at least one article accepted for publication in a refereed journal. Considering the number of years since the doctorate, this suggests that the group did have some commitment to research and publication and because of their voluntary attendance at this Presession, the commitment must be quite high.

9. Number of articles and reports written.

Number	Frequency	Percent
0 to 9	38	78
10 to 19	11	22
	49	100

Considering the number of years since the doctorate, this represents a fairly large number of reports and articles.

10. The number of research projects funded by USOE, NIMH, or other granting agencies.

Number	Frequency	Percent
0	29	59
1	10	20
2	4	8
3	3	6
4	1	2
5	1	2
6	1	2
	49	100

As these statistics suggest, the participants are quite involved with research.

The participants came from 23 states, Ontario, Canada, and Puerto Rico. The states and number of participants each contributed are as follows:

State	Frequency	Area
Alabama	1	South
Arkansas	1	South
California	2	West
Colorado	1	West
Connecticut	1	East
Illinois	2	Middle West
Indiana	2	Middle West
Kansas	1	Middle West
Kentucky	1	South
Maryland	1	South
Massachusetts	2	East
Michigan	2	Middle West
Minnesota	1	Middle West
Mississippi	1	South
New York	7	East
Ohio	7	Middle West
Oklahoma	1	Middle West
Oregon	1	West
Pennsylvania	1	East
Texas	1	South
Virginia	1	South
Washington	2	West
Wisconsin	4	Middle West

PARTICIPANTS

Twenty of the 49 participants were from the Middle West. Since most of them were paying their own expenses, this is understandable. This also suggests that perhaps AERA should attempt to locate and obtain outside funds which would enable more people to attend future presessions. Certainly proximity to the presession site is an important factor in deciding whether or not an individual is going to apply for attendance to courses of this nature. It is worth noting that the Director is conducting a two-day Presession on Nonparametric Methods in March of this year for the California Education Research Association. At the time of this writing, 25 educators have applied. All are from California.

The names and addresses of the participants are as follows:

Auria, Carl
Bureau of Educational Research
Kent State University
Kent, Ohio

Avital, Jhmvel M.
Ontario Institute for
Studies in Education
102 Bloor West
Toronto, Ontario, Canada

Baich, Henry
School of Education
University of Portland
Portland, Oregon

Capo de Rivero, Lillian
Division of Evaluation
Department of Education
University of Puerto Rico
Rio Piedras, Puerro Rico

Fink, Ruth W.
6710 Gates Mills Blvd.
Gates Mills, Ohio

Gadzella, Bernadette M.
512 Algoma Blvd., Apt. 301
Oshkosh, Wisconsin

Gill, Howell T.
College of Education
Eastern Kentucky University
Richmond, Kentucky

Gladden, Richard K.
545 Dartmouth Drive
King of Prussia, Pa.

Clark, Richard M.
Department of Ed. Psych.
State Univ. of N. Y. at Albany
Albany, New York

Clegg, Ambrose, A., Jr.
4021, 97th Avenue, S. E.
Mercer Island, Washington

Damico, Sandra B.
Ohio Education Association
225 East Broad Street
Columbus, Ohio

Drumright, Russel O.
Department of Education
Bowling Green State University
Bowling Green, Ohio

Ferris, Manford J.
39764 Costa Way
Fremont, California

Johnson, Cecil L.
835 West Trent Avenue
Spokane, Washington

Keepes, Bruce D.
Palo Alto Unified School Dist.
25 Churchill Avenue
Palo Alto, California

Keith, H. Virginia
Faculty of Education
University of Ottawa
Ottawa, Ontario, Canada

(Kliebhan) Sister M. Camille
6801 North Yates Road
Milwaukee, Wisconsin

Cawley, William J.
Illinois State University
Psychology Department
Normal, Illinois

Connella, Carmella
Boston University, Sargent
  College
University Road
Boston, Mass.

Gozali, Joav
Yeshiva University
55 Fifth Avenue, Rm. 1121
New York, New York

Graf, Rolland W.
3520, 30th Avenue
Kenosha, Wisconsin

Gulo, E. Vaughn
Northeastern University
Boston, Mass.

Hick, Thomas L.
Child Study Center
State University
New Paltz, New York

Hill, Russell A.
Address Unknown

Irwin, Claire C.
369 Education Building
College of Education
Wayne State University
Detroit, Michigan

Kohler, Emmett T.
Box 911
State College, Mississippi

Krogstad, Roland J.
2718 Regent Street
Madison, Wisconsin

Lewis, Leslie
Southeastern State College
Durant, Oklahoma

Liechti, Carroll D.
Research & Information Ser. Div.
Unified School Dist. 259
Wichita, Kansas

Lopez-Machado, Gregorio
MA-15, Villa Fontana
Carolina, Puerto Rico

Lundsteen, Sara W.
University of Texas
College of Education
Austin, Texas

Marlowe, Byron H.
225 East Broad Street
Columbus, Ohio

McCormick, Florence H.
South Central Region Educational
  Laboratory
Little Rock, Arkansas

Mietus, Walter S.
J. M. Patterson Building
University of Maryland
College,Park, Maryland

Murray, Frank B.
Department of Ed. Psych.
University of Minnesota
Minneapolis, Minnesota

Nelson, Randolph J.
Department of Ed. Psych.
University of Connecticut
Storrs, Connecticut

Rusch, Reuben R.
State Univ. of N. Y. at Albany
228 Education Building
Albany, New York

Silverman, Toby R.
Lexington School for the Deaf
New York, New York

Slaichert, William M.
School of Education
University of Denver
Denver, Colorado

Null, Eldon J.
Department of Education
Purdue University
Lafayette, Indiana

Pigge, Fred L.
Department of Education
Bowling Green State Univ.
Bowling Green, Ohio

Rajpal, Puran Lal
F-2, Birchwood Drive
Fredonia, New York

Robek, Mary F.
303 North Hamilton Street
Ypsilanti, Michigan

Rohrer, Janet R.
Kent State University
Dept. of Office Adminis.
Kent, Ohio

Rosemier, Robert A.
College of Education
Northern Illinois University
DeKalb, Illinois

Smith, Arthur E.
St. Mary's College
Notre Dame, Indiana

Thomas, Margaret J.
Presbyterian Board of Christian Education
Box 1176
Richmond, Virginia

Watkins, James Foster
P. O. Box 869
First National Bank Building
Auburn, Alabama

Wilson, Ellen L.
Clarke Institute of Psychiatry
250 College Street
Toronto, Ontario, Canada

PROCEEDINGS

A. Schedule of Events.

Participants arrived at the Sheraton Chicago Hotel during the day preceeding the commencement of the Presession. Arrangements for travel and funding of their stay were left to each participant.

The intended schedule was drawn up by the Director and his instructional staff prior to the Presession. The schedule was closely followed except that the discussion sections were abandoned and replaced with lectures. It was decided to pace the lectures so as to permit questions by the participants as the lectures proceeded.

B. Presession Structure.

Instruction was conducted by means of four ninety-minute lectures per day. Prepared handouts accompanied each lecture. Related readings were assigned in the text, Distribution-Free Statistical Tests by James V. Bradley, WADD Technical Report, 60-661 (Office of Technical Services, U.S. Department of Commerce, Washington, D.C., $3.00) which participants purchased at the first lecture of the Presession. Reprints of relevant journal articles were made available to the participants. Originally, participants were expected to write short group reports on exercises solved during planned informal discussion periods. These were to have been used for participant evaluation. This goal was dismissed when it was learned that not all participants were sufficiently prepared for the material to be presented.

THE COURSE OUTLINE

The course outline was built around clusters of nonparametric tests and related experimental designs. Consideration was also given to a structure whereby new material was built on procedures described earlier. The course content was as follows:

I. Tests of Hypotheses Involving Proportions:

1. The course began with the Fisher Exact test for the equality of the parameters of independent binomially distributed random variables.

2. As a special case of the Fisher Exact test, the Median test was presented and illustrated.

3. The large sample extension of the Fisher Exact test to the familiar Chi-square test was made and examples were used to illustrate the procedures.

4. The Median test was extended to more than two samples and examples from educational research were considered.

5. Post hoc procedures for the Chi-square test and the large sample Median test were derived and illustrated.

II. Tests of Independence for Contingency Tables:

1. This presentation began with tests for statistical independence for two dichotomous variables. These were derived, the phi coefficient was introduced, and examples were presented.

2. Tests for interaction across contingency tables and associated post hoc procedures were illustrated and discussed.

III. Tests on Correlated Observations (Repeated Measures Designs):

1. The Sign test was introduced and illustrated.

2. Special cases of the Sign test, Stuart's tests for trend, were described and their use was demonstrated.

3. Spearman's rho and the Wilcoxon Matched-Pairs Signed Ranks test were treated in one lecture with respect both to theory and real data.

4. Kendall's coefficient of concordance and the Friedman test were illustrated and derived.

5. Post hoc comparisons for the Friedman test were discussed and applied to an experimental study.

6. Cochran's Q test and associated post hoc procedures were obtained and the McNemar test as a special case of the Cochran Q test was illustrated.

7. Rank analog to Hotelling's T^2 and the corresponding post hoc procedures were introduced and an example of their use was presented.

IV. Tests of Independent Observations from Two or More Samples:

1. The Wilcoxon test (Mann-Whitney) was introduced and an application of the Wilcoxon test to block designs was presented.

2. Three forms of the Normal Scores test were described and illustrated.

3. The Kruskal-Wallis test as an extension of the Wilcoxon test was made and post hoc procedures associated with the Kruskal-Wallis test were presented and illustrated.

TIME SCHEDULE

The planned schedule was ignored and the following schedule was adopted:

Day	Time	Topic
1	8:30 - 10:00	Discussion of class objectives and review of classical statistical methods.
	10:30 - 12:00	Continuation of review.
	1:30 - 3:00	The Binomial and Hypergeometric distribution.
	3:30 - 5:00	Fisher exact test.
2	8:30 - 10:00	Median test and Chi-square test.
	10:30 - 12:00	Extension of the Median test to K samples.
	1:30 - 3:00	Post hoc procedures for the Chi-square and Median tests.
	3:30 - 5:00	Tests for Independence in Contingency tables.
3	8:30 - 10:00	Tests of interaction across contingency tables and associated post hoc procedures.
	10:30 - 12:00	The Sign test and Stuart's tests for trend.
	1:30 - 3:00	Spearman's rho [illegible] the Wilcoxon test for matched [illegible]

	3:30 - 5:00	Kendall's coefficient of concordance and the Friedman test
4	8:30 - 10:00	Post hoc procedures for the Friedman test.
	10:30 - 12:00	Cochran's Q test and associated post hoc procedures.
	1:30 - 3:00	The McNemar test as a special case of the Q test.
	3:30 - 5:00	Rank analog to Hotelling's T^2 and corresponding post hoc procedures.
5	8:30 - 10:00	Wilcoxon test (Mann-Whitney) and application of the Wilcoxon test to block designs.
	10:30 - 12:00	Test on aligned observations.
	1:30 - 3:00	Normal scores test for the two-sample problem.
	3:30 - 5:00	Kruskal-Wallis test and associated post hoc procedures.

STUDY AND REFERENCE MATERIALS

Each staff member prepared five detailed lectures. These lectures were presented and given to the students. They were carefully followed and used as the lecture proceeded. Participants could refer to the printed materials as the instructor lectured and, therefore, did not have to write notes and copy from the blackboard to comprehend and follow the train of thought being expressed by the instructors. Since it was assumed that the blackboard facilities would not be adequate, the lectures were prepared in detail. Copies of the lectures are attached to this report.

Prior to the Presession, letters were written to the authors of pertinent journal articles for permission to xerox the articles for distribution to the participants. Every author gave this permission. The articles were, therefore, xeroxed and presented to the students.

Each student purchased an inexpensive but excellent text book on nonparametric methods, Distribution-Free Statistical Tests by James V. Bradley. The manuscript was prepared by the Aerospace Medical Division, Wright-Patterson Air Force Base, Ohio, and is available to the public via the United States Department of Commerce. The text cost each student \$3.25: three dollars for the text and 25¢ for the mailing of the text to Chicago from Berkeley.

EVALUATION MATERIALS

Each student was given three multiple choice tests containing very difficult items. The tests are included with this report as an appendix. The statistics for the three tests are as follows:

Test	Average No. Correct	Standard Deviation
One	12.2	5.6
Two	13.1	4.1
Three	22.6	.9

Examinations one and two were given on the third and fourth day of the Presession. Test three was given to the participants on the last day. They were asked to mail the completed answer sheets to the Director. Only ten completed answer sheets were received.

The low scores on the tests are not unusual nor were they unexpected by the staff. The questions were deliberately written at a difficult level because it was incorrectly assumed that the participants would be better prepared than they actually were. While knowledge of the binomial and hypergeometric distributions is essential to the use of many nonparametric methods, it turned out that most participants had only superficial knowledge of these important statistical distributions. Another weakness noted by the staff is the relatively poor training that students in schools of education obtain concerning the importance of confidence intervals. It seems that most instructors of statistics overemphasize the testing of "null hypotheses" and ignore the more important procedures associated with confidence intervals and their use for making statistical inferences. Since the Presession emphasized the use of simultaneous multiple confidence interval procedures, almost all of the material presented to the participants was "new".

EVALUATION BY STAFF

At the end of the Presession, an item questionnaire was given to each of the five staff members for completion. The questionnaire dealt with matters concerning the physical environment, the scheduling, and the organization of the Presession. It allowed comments to be made by the staff regarding their perception of the participants. A list of the items and a tally of the five staff members' responses are given. Staff members "Commendable" responses are tallied in column "C", their "Satisfactory" responses in column "S", and their "Unsatisfactory" responses in column "U".

C	S	U	
			1. Environmental conditions
	3	2	a. Classroom spaces
	5		b. Work spaces
	4	1	c. Living quarters
	1	4	d. Teaching equipment, aids (chalk boards, public address system, etc.)
1	4		e. Resource material, library
1	4		f. Eating facilities

			2. Participants
	1	4	a. Appropriateness of academic backgrounds
	5		b. Sufficiency of research experience
4	1		c. Willingness to work
	5		d. Intellectual curiosity
2	3		e. Concern for applicability of techniques
2	3		f. Aspiration
	2	3	g. Immediate preparation for Presession
			3. Organization
	5		a. Adequacy of notice to applicants
1	4		b. Sufficiency of preplanning
1	4		c. Smoothness of operation
2	2	1	d. Adaptability to obstacles and feedback
1	4		e. Sensitivity to grievances
	3	2	f. Adequacy of financial support
			4. Schedule
	1	4	a. Appropriateness of five days for the job
1	4		b. Time spent efficiently
	5		c. Events sequenced appropriately
1	4		d. Punctuality
	5		e. Balance between formal, informal affairs
1	2	2	f. Quantity of discussions
2	3		g. Quality of discussions
3	2		h. Quality of formal presentations
	5		i. Unobtrusiveness of evaluation efforts
	2	3	j. Methods of evaluation
			5. Outcomes
2	2	1	a. Intended content was actually taught
1	4		b. Increase in participant understanding
2	3		c. Improvement in attitude toward research
3	2		d. Personal associations initiated

For the most part, the staff agreed on most issues. They were not in agreement on adaptability to obstacles and feedback, on the quantity of discussion, and on the intended content actually taught. The staff thought that the teaching equipment, the appropriateness of academic backgrounds, immediate preparation on the part of the participants for the Presession, the appropriateness of a five-day Presession, and the methods used for evaluation were unsatisfactory. If this Presession is given again, these characteristics will be given extra attention.

EVALUATION BY PARTICIPANTS

The participants took full advantage of the opportunity offered them to comment on the operation of the Presession. A summary of their responses, together with particularly germain comments, follows:

1A. To what extent did the relative availability or unavailability of books and journals interfere with or promote your attempts to master the content of this session?

Response	Frequency	Percent
None	35	83
Little	4	10
Some	3	7
	42	100

Participants were given detailed handouts and therefore did not have to refer very frequently to textbooks and research articles. Also, participants were told to bring copies of statistical tables which are usually found in most elementary statistics texts. Thus, lack of reference materials was not a real problem for the participants.

1B. To what extent did reproduced materials given to you by the staff improve matters?

Response	Frequency	Percent
Helpful	8	19
Very Helpful	34	81
	42	100

The staff was quite pleased with the reception the participants gave to the handouts. In this case, one can be sure that they have not become throw-aways. It was reported that the handouts made all the difference, were tremendously helpful, or were essential to the course. It was also noted by some that the handouts were well fitted for use when the participants returned to their home base.

2A. Did you feel that you lacked a "place to work," either alone or in small groups?

Response	Frequency	Percent
Yes	9	21
No	31	73
No Comment	2	5
	42	100

Since no homework was assigned, a working or discussion place was not really needed.

2B. Was your room satisfactory?

Response	Frequency	Percent
Yes	33	79
No	7	17
No Comment	2	5
	42	100

Some of the rooms were not in the best of condition. On the other hand, some rooms were quite fine and excellent.

3A. Which features of the meeting rooms were inadequate or not conducive to learning?

Response	Frequency	Percent
Blackboards	29	43
Size	17	25
Light	2	3
Sound	1	1
Air	7	10
Furnishings	6	9
Lack of Overhead Projector	3	4
Miscellaneous	3	4
	68	100

The blackboard facilities were atrocious. They were not conducive to the staffs' needs or presentations. They were wobbly, difficult to write upon, and next to impossible to read. More attention must be given to these facilities when selecting future AERA Presession sites. According to some participants, the chalkboards were too small. The crowded seating conditions and the lack of work space were frequently complained about. Simple lack of elbow room was a common complaint.

3B. Which features were especially facilitative in the same regard?

Response	Frequency	Percent
Convenience	2	5
Light	1	3
Sound	5	12
Air	1	3
Furnishings	2	5
No Comment	31	72
	42	100

The room was large, generally airy, and bright. Most of the participants could hear the speakers quite well. The majority welcomed the water pitchers because of the stuffy afternoons. Two mentioned the convenience of having the meetings where they were residing.

4A. Was five days too long a period to leave your work at home for the purpose of attending this session?

Response	Frequency	Percent
Yes	7	17
No	35	83
	42	100

Five days was clearly not too long The staff felt that two days should be spent on review of classical statistics with an expansion of the probability notions associated with the binomial, hypergeometric, and uniform distributions The participants were ill-prepared to handle confidence intervals and multiple post hoc procedures. The nonparametric material could have been extended and presented at a slower pace and with a greater emphasis on experimental design A ten-day presession with a well-organized laboratory section would have made the presentation more valuable for most students and a bit more relaxing for the staff. Both students and staff worked hard.

4B. Was five days too short a period in which to learn much of the content of this session?

Response	Frequency	Percent
Yes	35	83
No	7	17
	42	100

Five days was too short. One thing which was quite disheartening to the staff was the necessity to stifle and cut short any tangent discussions. Without question, these extraneous discussions are useful. On the last day, the Director did become involved in a discussion of experimental design related to his own research. The response and reaction of the class to these kinds of discussions was always positive and reinforcing. As one student reported, more linkage of methods to design was needed. Next time, if there is a next time, these discussions will be encouraged; but for them, more classroom time is needed.

5A. Were you allowed enough time in which to pursue activities of your own choosing?

Response	Frequency	Precent
Yes	28	67
No	13	31
No Comment	1	2
	42	100

In the evening the participants were free to attend plays, concerts, movies, sports events, cocktail bars, dinner, and even study if they so desired. The staff felt that 8:30 a.m. to 5:00 p.m. on nonparametric methods was a lot to ask of any student. Therefore, an attempt was made to let the participants unwind after lectures. However, the individuals who responded "No" to this item felt that much of their free time was occupied by keeping up their classwork and reviewing the materials presented during the day.

5B. Would you have preferred not to meet in the evening after dinner?

Response	Frequency	Percent
Yes	12	29
No	10	24
No Comment	20	48
	42	100

Since there were no evening meetings, this question was not directly applicable. Perhaps the "yes" answers referred to general feelings about evening meetings after all day sessions.

5C. Would you have preferred more or fewer meetings per day than there actually were? Or was the number of meetings per day agreeable to you?

Response	Frequency	Percent
Fewer	5	12
Enough	36	86
More	1	2
	42	100

The staff agrees with the participants. Four meetings a day are enough. However, one meeting devoted to laboratory work or group discussions would still be desirable.

6A. Were the individual lectures too long to sit and listen or take notes?

Response	Frequency	Percent
Yes	14	33
No	28	67
	42	100

Some of the lectures were definitely too long, or seemed to be, since the material was sometimes very heavy and abstract. As one participant reported, "Too much material is tiring."

6B. Were the lectures scheduled in an appropriate sequence?

Response	Frequency	Percent
Yes	40	95
No	2	5
	42	100

Considerable time was spent in organizing the material so the new ideas and new tests could be built on foundations laid earlier. The staff seemed to be quite successful in using this spiralling type of presentation.

7. Did you have sufficient opportunities to interact with other participants?

Response	Frequency	Percent
Yes	25	60
No	17	40
	42	100

The staff felt that they did not have a chance to interact with enough of the participants. Perhaps part of the problem is related to the length of the Presession. It takes more than five days to be able to communicate and discuss educational research problems on a common level of understanding. It takes time for people to get to know one another and for individual personality characteristics to emerge. Verbal interaction or communication between people who are essentially strangers is difficult. Perhaps a cocktail party on the night before the Presession or the group discussion periods which were planned but abandoned would have helped to improve intercommunication and interaction. Without doubt there should be more opportunities for this kind of communication.

8A. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention that you desired?

Response	Frequency	Percent
No	41	98
No Comment	1	2
	42	100

The staff is quite flattered, but wish they could have done more.

8B. Was it helpful to have graduate student assistants present?

Response	Frequency	Percent
Yes	33	79
No	4	10
No Comment	5	12
	42	100

Without the graduate assistance, the Presession would have fallen on its face. The behind the scenes activities that they performed for the teaching staff were invaluable. If the discussion sections could have been held, there is no doubt that the work of the graduate assistants would have been first rate and of immense value to the participants.

9. Did the attempts to evaluate your progress and reactions during the session (and at this moment) interfere with your work here?

Response	Frequency	Percent
Yes	11	26
No	30	71
No Comment	1	2
	42	100

The evaluation was not very satisfactory. The tests were too difficult for the background possessed by the participants and the tests should never have been given. They were only given because of this report. They did create anxiety and in that sense were harmful.

10. In general, was the Presession well organized?

Response	Frequency	Percent
Very Well	21	50
Well	19	45
No Comment	2	5
	42	100

When the tremendous amount of work that was performed prior to the Presession on the part of the staff is noted, it is very gratifying to learn that the participants were appreciative. Unfortunately, a couple of the participants felt that the Presession was a little too well organized or over-organized.

11A. Did the content of the lectures and readings presuppose far more previous training than you had?

Response	Frequency	Percent
Yes	28	67
No	14	33
	42	100

This was unfortunate; yet the staff continually lowered it's horizon as the Presession progressed. As one student reported, "I still wonder if you were following dissonance theory, throwing so much at us on the first day." But, fortunately, several participants felt that the instructors were taking into account the level of the participants and were restructuring as they went along and, indeed, this was true.

11B. Should less training in these areas or more have been presupposed?

Response	Frequency	Percent
More	5	12
Neither	13	31
Less	24	57
	42	100

Next time, less training will be assumed.

12. To what extent was the content of the lectures and readings relevant to what you hoped to accomplish during the session?

Response	Frequency	Percent
Some	12	29
Much	25	60
No Comment	5	12
	42	100

The staff felt through the questions asked that some participants were really there to learn experimental design. Next time, advanced preparation for these students will be made. Without doubt, inclusion of experimental design material would have improved the Presession considerably. Even so, one participant reported, "This five-day session has opened up new vistas for me."

13A. Were the lecturers stimulating and interesting?

Response	Frequency	Percent
Yes, Usually, or Somewhat	26	62
Very	16	38
	42	100

According to one participant, "The staff is to be commended for their excellence." Again, the staff thanks the participants.

13B. Were the lecturers competent to speak on the subject assigned them?

Response	Frequency	Percent
Yes	42	100
No	0	0
	42	100

13C. Were the lecturers well prepared?

Response	Frequency	Percent
Yes	42	100
No	0	0
	42	100

14. Were you disappointed in any way with the group of participants?

Response	Frequency	Percent
Yes	5	16
No	37	84
	42	100

The participants were eager, receptive, and interested. They were a pleasure to have as students.

15. If you had it to do over again would you apply for this Presession which you have just completed?

Response	Frequency	Percent
Yes	40	95
No	2	5
	42	100

16. If a presession such as this is held again would you recommend to others like you that they attend?

Response	Frequency	Percent
Yes	42	100
No	0	0
	42	100

17. Do you anticipate maintaining some sort of contact with at least one of the Presession staff?

Response	Frequency	Percent
Yes	26	65
No	14	35
	40	100

The staff also hopes to do the same.

18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one?

Response	Frequency	Percent
Yes	42	100
No	0	0
	42	100

Without doubt the Presession was of immense value. The new ideas presented to the participants are going to improve their work and are certainly going to have an impact on education.

19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment?

Response	Frequency	Percent
Yes	5	12
No	37	88
	42	100

20. Is it likely that you will collaborate in research with someone else attending this Presession (other than those you already were likely to collaborate with)?

Response	Frequency	Percent
Yes	14	33
No	28	67
	42	100

21. Do you think that the staff should feel that it has accomplished its objectives during this five-day Presession?

Response	Frequency	Percent
Yes	35	83
No	3	7
Equivocal (due to question wording)	4	10
	42	100

The staff does not think it satisfied all of its objectives which were soon seen to be unrealistic. However, the staff is convinced that it has opened new approaches to research problems to the participants. Furthermore, the staff is convinced that the participants will ask new and different kinds of questions because of the exposure to the new ideas presented in the Presession

SUMMARY

The Presession on Nonparametric Methods and Associated Post Hoc Procedures was held at the Sheraton Chicago Hotel on the five days just prior to the 1968 AERA Convention in Chicago. While most of the participants were unprepared for the course planned by the instructional staff, the number of new ideas and the intellectual growth that has taken place in the participants clearly shows that the Presession has been successful. While it did not satisfy all of its originally stated objectives, it did open new vistas and new ways for looking at data collected in educational settings. The value in conducting this Presession will be measured in the payoffs to education. Both the staff and the participants expect this payoff to be large.

APPENDIX A

Examination One.

1. Compared to classical tests of hypothesis, distribution free tests are:

   a. easy to understand since they are generally derived from simple applications of probability formulas.
   b. easy to conduct since the arithmetic required is generally very simple, often involving simple counting.
   c. are often superior to or equal in efficiency to the classical test when the classical test is not appropriate.
   d. all of the above.
   e. none of the above.

2. If X is a binomially distributed random variable such that on any one trial $P(A) = \frac{1}{2}$, what is the probability of exactly two A's in three trials?
   a. 1/8
   b. 2/8
   c. 3/8
   d. 5/8
   e. 8/8

3. The variance of the contrast $\frac{1}{3}(\hat{p}_1 + \hat{p}_2 + \hat{p}_3) - \hat{p}_4$ is estimated by:
   a. $\frac{1}{3}\left\{\frac{\hat{p}_1\hat{q}_1}{n_1} + \frac{\hat{p}_2\hat{q}_2}{n_2} + \frac{\hat{p}_3\hat{q}_3}{n_3}\right\} + \frac{\hat{p}_4\hat{q}_4}{n_4}$
   b. $\frac{1}{9}\left\{\frac{\hat{p}_1\hat{q}_1}{n_1} + \frac{\hat{p}_2\hat{q}_2}{n_2} + \frac{\hat{p}_3\hat{q}_3}{n_3}\right\} - \frac{\hat{p}_4\hat{q}_4}{n_4}$
   c. $\frac{1}{3}\left\{\frac{\hat{p}_1\hat{q}_1 + \hat{p}_2\hat{q}_2 + \hat{p}_3\hat{q}_3}{n_1 + n_2 + n_3}\right\} + \frac{\hat{p}_4\hat{q}_4}{n_4}$
   d. $\frac{1}{9}\left\{\frac{\hat{p}_1\hat{q}_1}{n_1} + \frac{\hat{p}_2\hat{q}_2}{n_2} + \frac{\hat{p}_3\hat{q}_3}{n_3}\right\} + \frac{\hat{p}_4\hat{q}_4}{n_4}$
   e. None of the above.

4. If Z is a normally distributed random variable with expected value of zero and variance of one, then Z^2 has a sampling distribution which is

   a. normal.
   b. hypergeometric
   c. Chi-square.
   d. binomial.
   e. none of the above.

5. The test statistic for the classical test of $H_0: \sigma_1^2 = \sigma_2^2 = \sigma_0^2$ has a null distribution which is

   a. normal.

   b. $t_{N_1+N_2-2}$

   c. F_{N_1-1, N_2-1}

   d. hypergeometric.

   e. $\chi^2_{N_1+N_2-2}$

6. Which of the following are valid combinations of the parameters for the application of the Chi-square analog to Scheffe's theorem? Mark as many as applicable.

   a. $p_1 - p_3$

   b. $\frac{n_1 p_1 + n_2 p_2}{n_1 + n_2} - p_3$

   c. $p_1 - p_2 + p_3$

   d. $2p_1 - p_2 - p_3 - p_4 + 2p_5$

   e. $-3p_1 - p_2 + p_3 + p_4 + 3p_5$

7. If the Y's are independent, according to the Central Limit Theorem, the sampling distribution of $T = Y_1 + Y_2 + Y_3 + \dots + Y_n$, where $E(Y_i) = \mu$ and $Var(Y_i) = \sigma^2$, is approximately normal with variance given by:

   a. $\sqrt{n}\,\sigma^2$

   b. $\frac{\sigma^2}{N}\left(\frac{N-n}{N-1}\right)$

   c. $N\sigma^2$

   d. $\frac{\sigma^2}{N}$

   e. $\frac{N-1}{N}\,\frac{\sigma^2}{n}$

8. From a finite population of size 50 with variance equal to 36, a random sample of size 7 is selected. The variance of the sampling distribution for means of samples of size 7 is given by:

   a. $\frac{\sigma^2}{N} = \frac{36}{50}$

   b. $\frac{\sigma^2}{n} = \frac{36}{7}$

   c. $\frac{\sigma^2}{n}\left(\frac{N-n}{N-1}\right) = \frac{36}{7}\left(\frac{50-7}{50-1}\right)$

   d. $\frac{\sigma^2}{N}\left(\frac{N-1}{N-n}\right) = \frac{36}{50}\left(\frac{50-1}{50-7}\right)$

   e. none of the above.

9. Nonparametric tests can legitimately be applied to a much larger set of situations than parametric tests because

   a. they require fewer assumptions.
   b. they require less elaborate assumptions.
   c. they have greater versatility.
   c. all of the above
   e. none of the above.

10. A distribution-free test

   a. makes no assumptions about the precise form of the sampled population.
   b. makes no assumptions about the precise value of the parameters of a sampled population.
   c. requires that the sampled population be symmetrical
   d. does not substitute other quantities for the observed values.
   e. none of the above.

11. The mean square contingency coeffient denoted by $\hat{\phi}^2 = \frac{\chi^2}{n}$ is a number

   a. between 0 and 1.
   b. greater than or equal to 0
   c. less than or equal to 1.
   d. unbounded in both directions.
   e. none of the above.

12. When the hypothesis of the Irwin-Fisher test is true, the resulting test statistic has

    a. a t distribution.
    b. a binomial distribution.
    c. a Chi-square distribution.
    d. a normal distribution.
    e. a hypergeometric distribution.

13. The assumptions for the Irwin-Fisher test are

    a. independent random samples from identical continuous distributions.
    b. match paired observations from a binomial distribution.
    c. independent random samples from binomial distributions.
    d. independent random samples from distributions with identical variances.
    e. correlated samples from hypergeometric distributions.

14. The Chi-square test of independence is

    a. derived from normal probability theory
    b. used to test the hypothesis of equality of medians.
    c. a test which assumes equality of variance.
    d. a one sample test.
    e. none of the above.

15. For an R by C contingency table the number of degrees of freedom is given by

    a. R(C - 1)
    b. C(R - 1)
    c. (R - 1)(C — 1)
    d. RC
    e. None of the above.

16. The large sample approximation to the Irwin-Fisher Exact test

    a. assumes $n_1 = n_2$
    b. utilizes $Z = \frac{X_1 - E(X_1)}{Var(X_1)}$
    c. requires a correction for continutity.
    d. is a one sample test.
    e. none of the above.

17. The Irwin-Fisher test is the nonparametric analog to

    a. The Welch-Aspin test.
    b. the two sample t-test.
    c. the K sample F-test.
    d. all of the above.
    e. none of the above.

18. The Irwin-Fisher test is used to test

    a. $p_1 = p_2$
    b. $\mu_1 = \mu_2$
    c. $M_1 = M_2$
    d. $p_1 = p_2 = \cdots = p_k$
    e. $\sigma_1^2 = \sigma_2^2$

19. The principal reason for using the arc sine transformation $\hat{\Phi}_k = 2 \arcsin\sqrt{p_k}$ in place of the proportion p_k in the statistic U_0' and in contrasts is to

    a. test the hypothesis of equality of the populations in terms of more easily interpreted parameters.
    b. simplify computations.
    c. increase the degrees of freedom in the computation of
    d. guarantee that the null distribution of U_0' is approximately Chi-square.
    e. Increase the power of the test

20. Which is not an assumption needed to insure valid use of the Chi-square approximation to the Irwin-Fisher test?

    a. the expected frequencies should be greater than or equal to 5.
    b. Independence between observations.
    c. The underlying distribution of the variable is normal.
    d. The probability of the qualitative variable is constant over subjects.
    3. nome of the above.

21. If in a 2 x 2 contingency table it is found that Φ^2 is not statistically different from zero, then it is known thata type one error has been committed or that

   a. $\Delta = 0$
   b. $\Delta = 1$
   c. $\gamma = 1$
   d. $P(A_i \cap B_j) = P(A_i)\,P(B_j \mid A_i)$
   e. $P(A_i \cup B_j) = P(A_i) + P(B_j)$

22. The phi coefficient

   a. is derived from Pearson's Product Moment Correlation Coefficient.
   b. assumes that the two variables are normally distributed.
   c. assumes that one variable is normally distributed and the other is binomial.
   d. is not a valid measure of association.
   e. none of the above.

23. An investigator who uses a Chi-square test for homogeneity to test H_0: $p_1 = p_2 = \ldots = p_7$ in a 2 x 7 table rejects his hypothesis. He decides to use the Chi-square analog to Scheffé's theorem to examine differences among the p_k. The value of $\sqrt{\chi^2}$ to be used in the confidence interval would have how many degrees of freedome?

   a. 1
   b. 2
   c. 6
   d. 7
   e. indeterminate from the information given.

24. How many confidence intervals may the investigator of question 23 set up if he uses the Chi-square analog and wants to hold the overall probability of a type one error to .05?

   a. 1
   b. 6
   c. 7
   d. a limited but unspecified number.
   e. an unlimited number.

Examination Two.

1. An investigator is interested in the auditory discrimination of 50 matched-pairs of children. In computing the differences, $X_i - Y_i$, he finds 10 pairs of tied observations $x_i = y_i$ which he discards. The Wilcoxon matched pairs test is computed on the remaining observations. His procedure is

   a. desirable because it discards observations which give no information.
   b. undesirable because it reduced the power of the test.
   c. desirable because it permits the use of exact tables.
   d. undesirable because it increases the power of the test spuriously.
   e. either desirable or undesirable.

2. The Wilcoxon matched-pairs test can be used to test the hypothesis H_0: $\mu = 50$ as well as H_0: $M = 50$ if the population distribution of scores is

   a. negatively skewed.
   b. normal.
   c. positively skewed.
   d. all of the above.
   e. none of the above.

3. The Wilcoxon matched-pairs test for related observations is the nonparametric analog of

   a. F-test, $F = MSB/MSW$
   b. t-test, $t = (\bar{X} - \bar{Y})/s_p \sqrt{\frac{1}{n_x} + \frac{1}{n_y}}$
   c. Z-test, $Z = (\bar{X} - \bar{Y})/\sqrt{\frac{\sigma^2_x}{N_x} + \frac{\sigma^2_y}{N_y}}$
   d. Welch-Aspin, $t^* = (\bar{X} - \bar{Y})/\sqrt{\frac{s^2_x}{N_x} + \frac{s^2_y}{N_y}}$
   e. none of the above.

4. An administrator who is interested in the possible effect of school district consolidation on pupil-teacher ratios compares the median pupil-teacher ratios for 60 presently consolidated districts before and after consolidation. He believes that the underlying distribution of pre-post consolidation differences is extremely positively skewed. Indicate the

most and least appropriate test statistics respectively for his hypothesis.

a. Wilcoxon matched-pairs test, Randomization t--test
b. Sign test, Wilcoxon matched-pairs test
c. Randomization t-test, Sign test
d. Wilcoxon matched-pairs test, Sign test
e. Randomization t--test, Wilcoxon matched-pairs test

5. The hypothesis that scores increase monotonically over time can be tested by the Cox-Stuart tests for trend. The hypothesis can also be tested by

a. Fisher randomization t-test
b. Wilcoxon matched-pairs test for a single sample.
c. Wilcoxon matched-pairs test for related samples.
d. Significance test for Spearman rho
e. None of the above.

6. The median test for 2 independent samples is

a. more powerful than the t-test
b. derived from the sign test
c. requires equal sample size
d. symmetrical about the median
e. none of the above

7. For the interaction test H_0: $\Delta_1 = \Delta_2 = \cdots = \Delta_k$ where $\Delta_k = P_{1k} - P_{2k}$ tested against H_1: H_0 is false:

a. The underlying variables must have equal standard deviations.
b. The underlying variables are correlated.
c. The appropriate test statistic has a distribution that is approximately Chi-square with K - 1 degrees of freedom.
d. Has an associated post hoc comparison method that is based upon the assumption that all P_{1k} are equal and all P_{2k} are equal.
e. Is in reality only a K sample problem.

8. The Sign test for the median difference

a. Cannot be used if each pair is selected from a different population.
b. Cannot be used if each pair is measured in different units.
c. Cannot be used if one population is symmetrical and the other is skewed.
d. None of the above.
e. All of the above.

9. The test statistic $Z = (\hat{p}_1 - \hat{p}_2) \Big/ \sqrt{\frac{\hat{p}_0 \hat{q}_0}{n_1} + \frac{\hat{p}_0 \hat{q}_0}{n_2}}$ is the large sample form of

a. The sign test
b. The Chi-square test
c. The Wilcoxon matched pair test
d. The median test
e. The Irwin-Fisher test

10. To carry out the median test on two samples, one must

a. find the median of each sample
b. determine the combined median
c. take the difference between corresponding scores
d. rank the scores
e. none of the above

11. When using the Sign test as a substitute for the classical match pair t-test one must assume:

a. Pairs are independent and P(positive deviation) equals one-half.
b. Pairs are independent and variance is known.
c. Distribution of deviations is symmetric and pairs are independent.
d. the population is uniform with unknown variance
e. that the assigned ranks are equally likely and that there are no tied values

12. The Wilcoxon one-sample match pair test is

a. more powerful than the Sign test
b. less powerful than the Sign test
c. cannot be used as a substitute for the two smaple t-test
d. cannot be approximated by the Normal Distribution
e. a special case of the Irwin-Fisher test

13. The Irwin-Fisher test is based upon

a. ranking the plus and minus samples resulting from performing the Sign Test.
b. the binomial distribution.
c. sampling with replacement.
d. all of the above.
e. none of the above.

3

14. If the linear contrast following the Friedman Test is significantly different from zero and positive

    a. The median of the population from which the sample came also has a linear component.
    b. The expected values of the populations from which the samples came also have a linear component.
    c. The variances of the populations from which the samples came increase as k increases.
    d. The expected average ranks have a linear form.
    e. The centers of the distributions increase as k increases.

15. The 2 x 2 x K contingency table problem

    a. has no simple 2 x 2 contingency table counterpart.
    b. can only be performed if all estimated expected frequencies exceed 5.
    c. can be performed if not more than 20% of the cells have estimated frequencies that exceed 5.
    d. is tested against a simple alternative as as epposed to an omnibus alternative.
    3. is based upon a Chi-square statistic of the Karl Pearson Form $\sum \frac{(O-E)^2}{E}$

16. In a study involving men and women, who were later classified as above or below average intelligence and were also rated as to their ability to complete a 5 day course on nonparametric statistics it was found that $\hat{\gamma}_M = +3.216$, $\hat{\gamma}_F = .0283$, $U_0' = 12.26$

    It can be concluded that

    a. for the women, expected performance is unrelated to intelligence.
    b. for the men, there exists a positive relationship between expected performance and intellegence.
    c. the confidence interval for $\gamma_M - \gamma_F$ will lie completely above zero.
    d. all of the above.
    e. none of the above.

17. Sign Test probabilities can always be computed from

    a. the hypergeometric formula.
    b. the binomial formula.
    c. the normal curve formula.
    d. none of the above.
    e. all of the above.

18. Compared to the classical t-test based on 50 observations, the Sign Test with almost the same power must use approximately

    a. 20 observations
    b. 32 observations
    c. 64 observations
    d. 80 observations
    e. 200 observations

19. The Match Pair Median test performed as a Sign Test can also be considered a test of $\mu_1 = \mu_2$ if

    a. the underlying distributions are skewed
    b. the samples are not random
    c. the observations are not independent
    d. all of the above
    e. none of the above

20. The Sign Test for the median difference has its greatest power when zero differences are discarded. Even though the power is greatest under this condition, it is not recommended because

    a. a zero difference being halfway between a plus or a minus is really supportive of the hypothesis.
    b. the observations in the sample are correlated.
    c. the resulting test statistic is difficult to compute.
    d. the probability of a type one error is increased.
    e. the power is not increased to justify the discarding of "embarassing" data.

21. If one adopts a conservative point of view when conducting a test of hypothesis, the appropriate procedure to follow when handling tied values in a nonparametric test is to:

    a. discard the tied values and reduce the sample sample size accordingly.
    b. randomly break the ties for each tied value by flipping an unbiased coin.

c. divide the tied values equally between the two adjacent categories and thereby maintain the original sample size.
d. divide the tied values so that the resulting outcomes are most compatible with the alternative hypothesis.
e. divide the tied values so that the resulting outcomes are most compatible with the hypothesis being tested.

22. The confidence interval for the median is based on

a. the hypergeometric distribution.
b. the normal distribution.
c. the Chi-square distribution.
d. the Binomial distribution.
e. none of the above.

23. If the Sign test for the median difference is tested against the one sided alternative that Method A is superior to Method B, and if the hypothesisis rejected, one can conclude in the distribution of original interest:

a. that the expected values of the two populations are different.
b. that large positive deviations are counterbalanced by large negative deviations with corresponding statements applying to small deviations.
c. that more than one half of the positive deviations are greater than zero.
d. that the elements of one population are on the average greater than the elements of the other population.
e. that the variances of the two populations are different.

24. If the hypothesis that $M = 32$ has been rejected by the Sign test, then the confidence interval for the unknown median

a. is narrower than that of the expected value.
b. is certain to contain 32.
c. might contain 32.
d. is certain not to contain 32.
e. none of the above.

25. The Sign test can be used to test

a. that the median of a population is equal to a specified value.

b. that the median difference for a pre and post test design is equal to zero.
c. that the expected difference in a match pair design is zero.
d. none of the above.
e. all of the above.

EXAMINATION THREE

1. For the Resenthal and Ferguson post hoc procedure for Friedman Contrasts, $\hat{\psi} = a_1 \bar{R}_1 + a_2 \bar{R}_2 + \ldots + a_k \bar{R}_k$ the "Scheffé" coefficient is given by:

a. $\sqrt{\chi^2_{k-1}(1-\alpha)}$
b. $\sqrt{(k-1) F^{(1-\alpha)}_{k-1, N-k}}$
c. $\sqrt{\frac{(k-1)(m-1)}{m-k+1} F^{(1-\alpha)}_{k-1, m-k}}$
d. $\pm Z\left(1 - \frac{\alpha}{2g}\right)$
e. $\pm t\left(1 - \frac{\alpha}{2g}\right)$

2. The Wilcoxon matched pairs test is a

a. test for independence.
b. one sample test.
c. substitute for the χ^2 test of homogeneity.
d. substitute for the F-test.
e. none of the above

3. The decision rule for the Sign test has been defined as reject H_0 if $X \in (0, 1, 5)$, the probability of falsely rejecting H_0 when it is true, is given by

a. 1/32
b. 2/32
c. 5/32
d. 7/32
e. 12/32

4. Stuart's tests for trend $S_2 + S_3$ are special cases of

a. the normal curve test.
b. the Wilcoxon test.

c. the Sign test.
d. the Irwin-Fisher Exact test.
e. the t-test.

5. The Kruskall-Wallis test for K groups is the nonparametric analog to

a. the Wilcoxon test.
b. The F-test for repeated measures.
c. the Welch-Aspin test.
d. the Chi-square test.
e. the One-way Analysis of Variance.

6. The exact hypothesis tested by the Kruskal-Wallis test is

a. K universes have identical distributions.
b. K universes have equal medians.
c. K universes have equal expected values.
d. $p_1 = p_2 = \dots = p_K$
e. K correlated populations are equal.

7. For the Kruskal-Wallis test, tied scores

a. tend to make H a conservative test.
b. make the test invalid.
c. cause the power to increase.
d. make the confidence intervals narrower than they really are.
e. are dropped for the analysis.

8. The test of H_0: $\gamma_1 = \gamma_2 = \dots = \gamma_K$ against H_1: H_0 is false, where $\gamma_k = \log_e \Delta_k = \log_e p_{11k} + \log_e p_{22k} - \log_e p_{12k} - \log_e p_{21k}$ assumes

a. K match paired samples from binomial distributions.
b. K independent random samples from multinomial distributions.
c. 2K independent random samples from binomial distributions.
d. 2K correlated samples from hypergeometric distributions.
e. K large independent random samples from K bivariate qualitative variable universes.

9. For the Friedman Test post hoc procedures are based on contrasts of the form $\hat{\psi} = a_1\bar{R}_1 + a_2\bar{R}_2 + \dots + a_K\bar{R}_K$

The variance of these contrasts is given by

a. $\frac{K(K+1)}{12n} \sum a_k^2$

b. $\frac{K^2-1}{12} \sum \frac{a_k^2}{n_k}$

c. $\frac{1}{1-\rho} \frac{K^2}{n} \sum a_k^2$

d. $\frac{K^2-1}{12n} \sum a_k^2$

e. $\frac{N^2-1}{12} \sum \frac{a_k^2}{n}$

10. If one is interested in q specific contrasts when $q < (K - 1)$,

    a. it is necessary to first test the K-sample omnibus hypothesis of equality.
    b. one can determine the q confidence intervals without first computing the test statistic.
    c. one should increase the sample size for the population of interest.
    d. one should decrease the value of α associated with the K sample omnibus test.
    e. one should determine each confidence interval with significance level set at α.

11. The Friedman test is an extension of the

    a. Median test.
    b. Wilcoxon Matched-pairs test.
    c. Chi-square test.
    d. Sign test.
    e. none of the above.

12. The degrees of freedom for the Friedman test equal

    a. the number of blocks minus 1.
    b. the number of conditions minus 1.
    c. the number of blocks times the number of conditions.
    d. the number of blocks minus 1 times the number of conditions minus 1.
    e. none of the above.

13. For the Friedman test, the hypothesis under test states

    a. the medians are the same for all conditions.
    b. the means are equal over conditions.
    c. the expected average ranks are equal over all conditions.

d. the proportion of successes in each condition are equal.
e. none of the above.

14. Kendall's Coefficient of Concordance

a. lies between -1 and 1.
b. shows a measure of the association for the Chi-square test of independence.
c. is a linear function of the Wilcoxon test statistic.
d. is derived from Pearson's Product Moment Correlation Coefficient.
e. none of the above.

15. To compute the Friedman test

a. rank each block separately.
b. rank over all conditions.
c. sum the scores over each condition.
d. rank the scores in each condition separately.
e. none of the above.

16. The asymptotic efficiency of the Wilcoxon test to the Mann-Whitney test is

a. 1
b. $3/\pi$
c. $2/\pi$
d. 0
e. none of the above.

17. For the Rosenthal and Ferguson post hoc procedures

a. the observed variances and covariances of the ranked data are employed to determine the confidence intervals.
b. the theoretical variance based on the uniform distribution is used to determine the confidence intervals.
c. one must have independent groups so that covariances need not be computed.
d. the covariances of the original variables must be equal.
e. the covariances of the ranked variables must be equal.

18. In performing an experiment when comparing two samples, let one sample contain 2 subjects and the other 5 subjects. Assume ranks from 1 to 7 are to be assigned to scores of the two samples. How many combinations

of ranks can the sample with 5 subjects take on?

a. 7
b. 10
c. 35
d. 42
e. none of the above.

19. Let $E(T) = \frac{n_1}{2}(n_1 + n_2 + 1)$ where T is the Wilcoxon statistic. If the Mann-Whitney statistic U equals $T - \frac{n_1}{2}(n_1 + 1)$ where $n_1 = 4$ and $n = 9$, find the E(U).

a. 10
b. 20
c. 36
d. 45
e. none of the above.

20. For a given N, the expected normal order statistics form a

a. normal distribution.
b. Chi-square distribution.
c. t distribution.
d. rectangular distribution.
e. none of the above.

21. If in the Bell-Doksum test the sum of the random normal deviates for one sample is denoted by L, then the sum of the random normal deviates for the second sample is

a. L
b. -L
c. indeterminate from the information given.
d. 0
e. none of the above.

22. With regard to the Van der Waerden test, the inverse normal scores are more commonly referred to as

a. Z-scores.
b. t-scores.
c. random deviates.
d. W-scores.
e. none of the above.

23. The small sample post hoc procedure of Tuback, Smith, Rose, and Richter for the Kruskal-Wallis test is

a. valid for the set of all possible contrasts.
b. controls the error rate by contrasts.
c. valid only for simple contrasts.
d. requires a re-ranking of the data.
e. is less powerful than the procedure that employs $C = \sqrt{\chi^2_{k-1}(1-\alpha)}$ as a multiplying constant.

24. The Kruskal-Wallis test

a. requires special tables for small samples.
b. has a power efficiency of 95% when compared to the one way analysis of the F-test.
c. requires independent observations between and within samples.
d. all of the above.
e. none of the above.

25. The large sample approximation for the Terry-Hoeffding and Van der Waerden Normal Scores tests require that the sample size of both samples be

a. greater than or equal to 8.
b. greater than or equal to 10.
c. greater than or equal to 17.
d. greater than or equal to 30.
e. none of the above.

APPENDIX B

The reprints of journal articles handed to participants were the following:

Cohen, Jacob. "An Alternative to Marascuilo's 'Large-Sample Multiple Comparisons' for Proportions," *Psychol. Bull.* 67 (1967), 199-201.

Kruskal, W. H. and Wallis, W. A. "Use of Ranks in One Criterion Analysis of Variance," *Journal of the American Statistical Association* 47, (1952), 583-621.

Marascuilo, Leonard A. "Large-Sample Multiple Comparisons," *Psychol. Bull.* 65 (1966), 280-290.

Marascuilo, Leonard A. and McSweeney, Maryellen. "Nonparametric Post Hoc Comparisons for Trend," *Psychol. Bull.* 67 (1967), 401-412.

Rosenthal, Irene and Ferguson, Thomas. "An Asymptotically Distribution-Free Multiple Comparison Method with Application to the Problem of n Rankings of m Objects," *British Journal of Mathematical and Statistical Psychology* 18 (1965), 243-254.

Wilcoxon, Frank. "Individual Comparisons by Ranking Methods," *Biometrics Bulletin* 1 (1945), 80-83.

PRESESSION V

DESIGN AND ANALYSIS OF COMPARATIVE EXPERIMENTS IN EDUCATION

Director

Dr. Jason Millman
Cornell University

INTRODUCTION AND OBJECTIVES

The 1968 Presession on the Design and Analysis of Comparative Experiments in Education marks the third straight year that the U.S. Office of Education has supported a five-day training session prior to the annual meeting of the American Educational Research Association. The experience and ideas which have come out of the previous presessions have contributed a great deal to the successes of the 1968 Presession.

The general objective of the presession is to increase the competence of educational researchers in matters of the design and analysis of comparative experiments. This objective is reflected behaviorally by the tests, problem sets, and inventories which form a part of the instructional materials. We strongly believe that increased effort needs to be made to get "good" research data and to use proper methods of analysis so that more rational decisions affecting educational practice can be made. In this presession, we hope to impart this attitude and to provide skills and knowledge which will contribute to the realization of this goal in situations in which the conduct of comparative experiments is appropriate.

STAFF

Director:
Jason Millman - Cornell
Department of Education
Ithaca, New York 14850

Full Time Instructor:
Kenneth D. Hopkins -
University of Colorado
Laboratory of Educational Research
Boulder, Colorado 80302

Part Time Instructor:
Donald T. Campbell -
Northwestern
Department of Psychology
Evanston, Illinois 60201

Part Time Instructor:
Nathan L. Gage - Stanford
School of Education
Stanford, California 94305

Graduate Assistant:
Bruce M. Gansneder - Ohio St.
School of Education
Columbus, Ohio 43210

Graduate Assistant:
Percy Peckham -
University of Colorado
Laboratory of Educational Research
Boulder, Colorado 80302

PARTICIPANTS

A. Selection of the Participants.

Applications were received through the office of the overall presessions director, Gene V. Glass. The principal criteria for selection were that applicants had taken at least one course in statistics, had indicated reasons for attending the presession which were consistent with the objectives of the program, and had received a doctorate. A few doctoral students were admitted, however, for special reasons.

Individuals who seemed overqualified were each written a personal letter raising the question of whether they might find it more profitable to attend a different presession. All applicants who were rejected were written a personal letter explaning the basis for the rejection.

A total of 99 individuals applied, of which 64 were accepted and attended the meeting, 24 were accepted but later dropped out because of conflicting obligations, and 11 were rejected.

B. Correspondence with Accepted Applicants.

The following letters were sent to all accepted participants.

1968 AERA Presession on the Design and Analysis of Comparative Experiments

To: Applicants Selected to Participate in the Design and Anaylsis Presession

From: Jason Millman and Kenneth D. Hopkins

Date: December 8, 1967

It is our pleasure to inform you that you have been chosen to be invited to participate in the 1968 AERA Design and Analysis Presession. The dates of the presession are from early Saturday morning, February 3 through Wednesday noon, February 7.

If for any reason you find it impossible to attend the Presession for the full five days, please telephone or write immediately to withdraw so that one of the several excellent alternates we had to turn down can be given your position.

The Presession will be held at the Abbey Resort Hotel on Lake Geneva, Fontana, Wisconsin. Our successful experience last year with a similar type of hotel in the New York city area influenced greatly our decision to choose the Abbey. We feel fortunate to be able to arrange for a group rate of $22.54 per day per person. This charge includes occupancy in a double room, meals, gratuities, sales tax, and access to the recreational facilities--many of which are free or have but a nominal charge.

Participants should check into the Abbey during the afternoon or evening of Friday, February 2. Chartered bus transportation from the OHare airport (Chicago) is being arranged in cooperation with the directors of another presession also being held at the Abbey. Buses will leave O'Hare over an extended period of time from early Friday afternoon to late that evening. Return transportation to Chicago is also being arranged. Cost will be in the neighborhood of a few dollars each way. Details will be discussed in another mailing which we shall send to you during the latter half of January.

It will not be necessary for you to make your own reservations at the Abbey; you need only check in on February 2, 1968. All participants will be placed in double rooms so that the expense can be held to the amounts quoted above. In the January mailing a list of participants will be included. You may at that time, indicate to us if you have a preference for a roommate.

We shall rely almost entirely on specially prepared instructional materials. The materials which you will be given at the Presession should be reasonably self-sufficient, though you may wish to bring along a few reference works (including an elementary statistics book) from your personal library. Come prepared to work.

We would hope that you could bring to the presession Experimental and Quasi-Experimental Designs for Research by Donald T. Campbell and Julian C. Stanley. Rand-McNally, 1966. I believe it sells for $2.00. The bulkier Handbook of Research on Teaching, (N.L.Gage, Editor) is equally satisfactory since the paperback is merely a reprint of Chapter 5 of the Handbook.

We recommend that prior to the February presession you read the first 22 pages in the Campbell-Stanley chapter mentioned above. In addition, you should be familiar with the basic ideas behind classical testing of statistical hypotheses as described in the accompanying paper.

We are honored that you have indicated a willingness to take five days off from what we are sure is a very busy schedule and spend it with us. In turn, we are putting a great deal of effort into the preparation of this presession to help insure that it will be a highly profitable experience to you. We look forward to working with you.

attachment

cc Guest instructors

211 Stone Hall
Cornell University
Ithaca, New York 14850

1968 AERA Presession on the Design and Analysis of Comparative Experiments

To: Applicants Selected to Participate in the Design and Analysis Presession

From: Jason Millman and Kenneth D. Hopkins

Date: January 17, 1968

This is our second, and should be our final, general mailing prior to the actual presession. Let us call to your attention two enclosures.

First, there is a description of transportation accommodations from Chicago to the presession site. This schedule has been worked out in cooperation with the other two presessions which are now also scheduled to be held at the Abbey. Dinner will be available at the Abbey on Friday evening (2/2) if you arrive while the main dining room is still open.

The second enclosure is a list of participants thus far expected to attend. Please indicate to us by January 26 at the latest if you have a preference for roommate. Should you wish to occupy a single room and are willing to pay the extra cost, please let us know this by the 26th of January also. Lacking any statement of preference, you will be assigned a roommate with somewhat common interests or position as indicated in the original application. It is not necessary for you to make your own reservation at the Abbey; you need only come and check in.

We are hard at work preparing individual notebooks which will contain close to 200 pages of specially prepared instructional materials, including expository papers, working papers, problem sets, and even paper on which to take notes. All you need to bring are some pencils, lots of energy, and, if convenient, the references listed in our first memo.

As is true with most of the presessions, we shall have a morning, an afternoon, and an evening session. Nevertheless, there will be approximately an hour and a half prior to dinner during which you may wish to go swimming, to go ice skating, or to enjoy the other recreational diversions available at the Abbey. Casual sports wear will be quite appropriate for the daytime sessions. Abbey regulations require sport or suit coats for men and street dresses for women at the evening meal.

We admit to a growing excitement as the presession draws close. Try to leave your troubles and work at home; we'll have sufficient problems to occupy you.

Attachments (2)

cc: Donald Campbell
Nathan L. Gage
Bruce M. Gansneder
Perc Peckham

211 Stone Hall, Cornell University
Ithaca, New York 14850

Travel Accommodations[1]

I. If you arrive at O'Hare airport.

Pick up your luggage and go to the circular restaurant building, centrally located at the airport, where a private room has been reserved for your convenience while waiting for chartered bus service to the Abbey. Liquid refreshments will be available. Specifically, the full name of the room reserved is Seven Continents Restaurant's VIP Meeting Room. This meeting room (not to be confused with VIP rooms of specific airline companies) is on the second floor of the restaurant building. It is suggested you use the one escalator in the building located in the center of the rotunda.

Subject to possible change, the reserved (yellow school) buses are tentatively scheduled to leave from just outside the restaurant building from the lower of the two street levels at 2:30, 4:00, 7:00, 8:00, 9:00, and 11:30. One way cost will be approximately $3.00.

II. If you drive.

The Abbey is located in Fontana, Wisconsin just across the Illinois border and on the southwestern edge of Lake Geneva. The locality of Walworth is one mile from the Abbey.

III. If you are in downtown Chicago.

Take a Milwaukee Road commuter train at Union Station to Walworth. Trains leave 9:30 a.m., 4:40 p.m., and 6:30 p.m. and arrive in Walworth 75 to 90 minutes later. (The 4:40 train does not operate on Saturdays or Sundays.) One way fare is listed at $2.77. If you notify them, Abbey personnel will pick you up at the Walworth Station.

Alternatively, you can take a Continental Air Transport Bus from the Monroe Street entrance of the Palmer House (Hotel) to the circular restaurant building and go to the Seven Continents Room as indicated in I. above.

IV. If weather forces O'Hare down and roads to the airport are blocked.

We shall endeavor to divert the chartered buses to the Monroe Street entrance of the Palmer House. Call the Chicago office of the Abbey, Area Code 312-332-3586, for instructions. You may not get any satisfaction, but you should get lots of sympathy.

Note: Chartered buses to downtown Chicago leaving the Abbey Wednesday after the noon meal are being arranged. Information will be provided during the presession meetings.

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[1] We are indebted to Andrea R. Rozran for supplying us with the information contained on this page and for making the necessary transportation arrangements.

C. Description of the Participants

The 64 participants came from 26 different states, three provinces in Canada, and Stockholm, Sweden. By far the most participants came from New York State.

Fifty-seven of the 64 participants were men. The median age was 39, with 34 and 43 being the first and third quartiles. The median year in which the doctoral degree was awarded was 1964, with 1959 and 1967 representing the first and third quartiles. Fifty-five of the participants indicated that this was the first AERA presession they had attended.

The median scoring participant devotes 50% of his time to research and has authored five research articles or technical reports.

D. Names and Addresses of Participants

Raymond J. Agan
103 Holton Hall
Manhattan, Kansas 66502
(Kansas State University)

James G. Anderson
Research Center, Box 3Y
University Park, N.M. 88001
(New Mexico State University)

Ronald D. Anderson
School of Education
Boulder, Colorado 80302
(University of Colorado)

Maurice C. Barnett
1300 University Club Bldg.
Salt Lake City, Utah 84111
(Utah State Board of Education)

Charles P. Bartl
College of Education
Reno, Nevada 89507
(University of Nevada)

Leon W. Bonner
P.O. Box 303
Normal, Alabama 35762
(Alabama A & M College)

Bartell W. Cardon
Ed. & Psych. Center, Bldg. 2
University Park, Penna. 16802
(Penna. State University)

June R. Chapin
1190 Bellair Way
Menlo Park, California 94025
(College of Notre Dame, on leave
from University of Santa Clara)

James W. Colmey
School of Education
Memphis, Tennessee 38811
(Memphis State University)

Richard J. Colwell
406 W. Michigan
Urbana, Illinois 61801
(University of Illinois)

Julianne L. Conry
1311 Morrison Street
Madison, Wisconsin 53703
(University of Wisconsin)

Harold Cook
414 Huntington Hall
Syracuse, New York 13202
(Syracuse University)

Arvin D. Crafton
801 Sycamore Street
Murray, Kentucky 42071
(Murray State University)

Anant S. Deshpande
310 Administration Bldg.
Atlanta, Georgia 30332
(Georgia Tech.)

Calvin O. Dyer
3002 UHS
Ann Arbor, Michigan 48104
(University of Michigan)

Herbert Garber
School of Education, U-4
Storrs, Connecticut 06268
(Univ. of Connecticut)

Allan W. Gibson
6833 Kingston Place
Tucson, Arizona 85710
(Amphitheatre Public Schools)

Frank P. Greene
707 Summer Avenue
Syracuse, New York 13210
(Syracuse University)

Edward V. Hackett
Bureau of Educ. Research
Kent, Ohio 44240
(Kent State University)

Judson A. Harmon
3263 N. Shepard Avenue
Milwaukee, Wisc. 53211
(Univ. of Wisc-Milwaukee)

Sten Henrysson
School of Education
Stockholm 34, Sweden
(University of Stockholm)

Michael J. A. Howe
Department of Education
Medford, Mass. 02155
(Tufts University)

John L. Hughes
Dept. 914, South Road
Poughkeepsie, N.Y. 12602
(IBM)

William H. Johnson
Dept. of Educ. Admin., Box 3R
University Park, N.M. 88001
(New Mexico State Univ.)

Jean-Marie Joly
Department of Education
917 Mgr. Grandin
Quebec 10, P.Q.
(Institute of Research in Educ.)

Evan R. Keislar
School of Education, 303 Moore
Hall, 405 Hilgard Avenue
Los Angeles, California 90024
(UCLA)

John J. Kennedy
College of Education
Knoxville, Tennessee 37916
(University of Tennessee)

Jeremy Kilpatrick
Dept. of Math. Education
New York, New York 10027
(Teachers College, Columbia)

Martin Kling
Graduate School of Education
10 Seminary Place
New Brunswick, N.J. 08903
(Rutgers-The State University)

Frederick G. Knirk
121 College Place
Syracuse, New York 13210
(Syracuse University

John R. Kolb
3303 Leonard Street
Raleigh, North Carolina 27607
(No. Carolina State Univ.)

Wilbur K. Kraybill
305 E. Fairview Avenue
Altoona, Pennsylvania 16601
(Penn. State Univ. at Altoona)

Leonard H. Kreit
Educ. Research Program
14th Avenue & Lake Street
San Francisco, Calif. 94118
(Dental Health Center, Public
Health Service)

Lisa R. Kuhmerker
81-14 Austin Street
Kew Gardens, New York 11415
(Hunter College)

Robert E. Leibert
Reading Center, Room 206
4825 Troost
Kansas City, Missouri 64110
(Univ. of Missouri at Kansas
City)

H. Keith MacKay
Box 578
Halifax, Nova Scotia
(Nova Scotia Dept. of Educ.)

Lester Mann
443 S. Gulph Road
King of Prussia, Pa. 19406
(Montgomery Co. Public Schools)

Rosemarie E. McCartin
404 Miller Building
Seattle, Washington 98105
(Univ. of Washington - on
leave from Seattle Univ.)

Thomas E. McCloud
19955 Lauder
Detroit, Michigan 48235
(Wayne Co. Child Development
Center)

Arthur S. McDonald
2 Richards Drive
Dartmouth, Nova Scotia, Canada
(Dept. of Education, Province
of Nova Scotia)

Richard J. McLeod
D-37 McDonel Hall
Science & Math. Teaching Center
East Lansing, Michigan 48823
(Michigan State Univ.)

James H. Moser
3415 N. 95th Street
Boulder, Colorado 80302
(University of Colorado)

Jerome Moss, Jr.
Dept. of Industrial Education
Minneapolis, Minnesota 55455
(University of Minnesota)

Owle H. Oldridge
Faculty of Education
Vancouver, British Columbia
(Univ. of British Columbia)

Angela Pace
4 Covance Street
Cortland, New York 13045
(State Univ. of N.Y. at
Cortland)

Paul T. Rankin, Jr.
30130 Wicklow Road
Farmington, Mich. 48024
(Detroit Public Schools)

Joseph Reswick
520 E. 21 Street
Brooklyn, New York 11226
(N.Y.C. Board of Education)

Barak V. Rosenshine
Ritter Hall
Philadelphia, Pa. 19122
(Temple University)

Donald R. Senter
Huntington, New York 11743
(Educational Developmental
Laboratories, Inc.)

Bernard J. Shapiro
School of Education
765 Commonwealth Avenue
Boston, Mass. 02215
(Boston University)

John L. Shultz
School of Education
St. Louis, Missouri 63121
(Univ. of Missouri at
St. Louis)

Theodore C. Sjoding
705 S. 121st Street
Tacoma, Washington 98444
(Pacific Lutheran University)

Gerald P. Speckhard
Valparaiso, Indiana 46383
(Valparaiso University)

Irving S. Spigle
242 South Orchard Drive
Park Forest, Illinois 60466
(Park Forest Public Schools)

Robert M. Smith
Special Education Bldg.
University Park, Pa. 16802
(Penn. State University)

William R. Stewart
235 Chambers Bldg.
University Park, Pa. 16802
(Penn. State University)

Howard W. Stoker
413 Education Bldg.
Tallahassee, Fla. 32306
(Florida State Univ.)

Jerome Taft
1410 NE Second Avenue
Miami, Florida 33132
(Dade County Schools)

Harriet Talmage
1011 N. Hayes Avenue
Oak Park, Illinois 60302
(Univ. of Illinois at Chicago
Circle)

Donald R. Thomsen
3808 Norriswood
Memphis, Tennessee 38111
(Central Midwestern Regional Ed.
Lab. & Memphis State Univ.)

Virginia H. Vint
7 Brookwood Drive
Normal, Illinois 61761
(Illinois State University)

John L. Wasik
3712 Horton Street #104
Raleigh, North Carolina 27607
(North Carolina State Univ.)

Theodore M. Zink
Glassboro, New Jersey 08028
(Glassboro State College)

E. Rough Guide to Research Interests of Participants

Administration and/or Organizations
- Colmey
- Johnson
- Neff

Attitudes
- Chapin
- Harmon
- Hines
- Kaltsounis
- Vint

Computers
- Chapin
- Taft

Creativity
- Harmon

Culture and Education
- J. Anderson

Curriculum/Instruction
- Agan
- Barnett
- Chapin
- Colwell
- Deshpande
- Garber
- Greene
- Johnson
- Keislar
- Knirk
- Leibert
- Mann
- McDonald
- Moss
- Oldridge
- Senter
- Spigle
- Smith
- Talmage
- Zink

Design, Measurement and/or Evaluation
- J. Anderson
- Barnett
- Bartl
- Bonner
- Crafton
- Deshpande
- Gibson
- Hackett
- Henrysson
- Hines
- Hughes
- Joly
- Kennedy
- Kreit
- MacKay
- Moser
- Reswick
- Senter
- Shapiro
- Sjoding
- Speckhard
- Spigle
- Stoker
- Taft
- Talmage
- Thomsen
- Wasik
- Zink

Disadvantaged and/or Slow Learner
- Harmon
- McCartin
- Rankin
- Smith

Early Child. Ed.
- Kuhmerker

Education in the Arts
- Colwell
- Stewart
- Vint

Higher Education
- Chapin
- Kaltsounis

Learning: (Verbal Learning; Concept Development; Child Development and Learning; Memory)
- Conrey
- Cook
- Greene
- Keislar
- Kennedy
- Kling
- Kolb
- Kuhmerker
- Mann
- McCartin
- Oldridge
- Rosenshine
- Shapiro
- Wasik

Math Education
- Dyer
- Kilpatrick
- Kolb
- Moser
- Pace

Media
- Kling
- Knirk

Motivation
- Alter
- McCloud

Personality
    Alter
    Dyer
    Hackett
    McCloud
    Shultz

Physical Education
    Mann

Physiological Indices
    Bartl
    McCloud

Problem Solving
    Harmon
    Kilpatrick
    Wasik

Pupil Personnel Programs
    Kraybill
    McDonald
    Shultz

Reading
    Dyer
    Kling
    Leibert
    Rosenshine

Science Education
    R. Anderson

Social Deviancy
    Zink

Teacher Behavior
    R. Anderson
    Chapin
    Crafton
    Harmon
    McLeod
    Rosenshine

SCHEDULE

Day	Session	Topics and Principal Instructors*
SAT	A.M.	Elementary design (M); nature of control (M); types and functions of variables (M); internal validity with emphasis on regression (M,H).
	Aft.	Internal validity (con't); interactions (M); external validity (M).
	Eve.	External validity (con't); relation of statistics to experimental design (H,M); functions of analysis (H,M).
SUN	A.M.	Introduction to classical analysis of variance model (H).
	Aft.	Rules of thumb for the analysis of complex, but balanced, experimental designs (M).
	Eve.	Rules (con't); question period.
MON	A.M.	Quasi-experimental designs (C).
	Aft.	Quasi-experimental designs (con't); analysis of unbalanced designs or designs in which ANOVA assumptions are not met (H).
	Eve.	Violations of assumptions, con't (H,P); question period; party.
TUES	A.M.	Analysis of covariance (H).
	Aft.	Multiple and planned comparisons (M,H)
	Eve.	Causal relations from correlational data (G); question period.
WED	A.M.	Interface between theoretical orientation and research design (G); Participant generated problem(s) in which an appropriate design and/or analysis plan needs to be formulated (G, M, H); participant attitude inventory.

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* M = Millman; H = Hopkins; C = Campbell; G = Gage; P = Peckham.

STUDY AND REFERENCE MATERIALS

Each staff member brought with him a selection of material supplementary to his lectures. Each participant was asked to bring Experimental and Quasi-Experimental Designs for Research by Donald T. Campbell and Julian C. Stanley. (Rand-McNally, 1966). Prior to coming to the Presession, each participant was mailed a copy of the first item listed below under "Materials."

Upon arrival at the presession site, each participant received a loose-leaf notebook which contained all the materials (demonstration and expository papers, problem sets, evaluation instruments, scrap paper) he needed. With the exception of items 17, 19, 22, 23, 25, 32, and 38, these materials are unpublished. A list of these materials follows.

Materials Used in the 1968 Presession on Design of Experiments

1. Introductory general remarks about inferential statistics, classical procedures. Jason Millman. P. 5.
2. Bibliography: design and analysis of experiments in education. Jason Millman. P. 7.
3. Randomization demonstration. Jason Millman. P. 1.
4. Poem demonstration. Jason Millman. P. 4.
5. The design of experiments - some elementary concepts. Jason Millman. P. 15.
6. Experimental treatments. Jason Millman. P. 2.
7. Notes on sources of internal experimental invalidity. Gene V. Glass. P. 2.
8. Instructional paper on regression and the matching fallacy. Kenneth D. Hopkins. P. 7.

9. Illustrations of sources of internal experimental invalidity. Gene V Glass. P. 2.

10. Quiz on elementary concepts of design and sources of internal invalidity. 8 test items. P. 3.

11. ANOVA interactions in factorial designs. Jason Millman. P. 8.

12. Problem set to accompany ANOVA interactions in factorial designs. Jason Millman. P. 5.

13. The external validity of comparative experiments in education and the social sciences. Glenn H. Bracht and Gene V Glass. P. 13.

14. Two untitled pictures. No author. P. 1.

15. CLUG Experiment. Jason Millman. P. 2.

16. Quiz on interaction and sources of external invalidity. 7 test items. P. 3.

17. Rules of thumb for writing the ANOVA table. Jason Millman and Gene V Glass. P. 11.

18. Problem set to accompany "Rules of thumb..." Jason Millman. P. 11.

19. BMD08V Analysis of variance. No author. P. 6.

20. Quiz on rules of thumb for writing the ANOVA table. 4 test items. P. 2.

21. Quasi-experiments in education. A 75 minute paper read to the participants by Donald Campbell. A final version (to be distributed to all participants) is now in preparation.

22. Quasi-experimental designs. Donald T. Campbell. P. 4.

23. Administrative experimentation, institutional records, and nonreactive measures. Donald T. Campbell. P. 12.

24. Consequences of failure to meet the assumptions underlying the analysis of variance. Gene V Glass. P. 12.

25. Testing homogeneity of variances. Gene V Glass. P. 2.

26. Computational illustrations - homogeneity of variance tests. Kenneth Hopkins. P. 2.

27. The analysis of repeated measures designs. Gene V Glass and Kenneth Hopkins. P. 6.

28. Program epsilon. Percy D. Peckham. P. 1.

29. The experimental unit in statistical analysis. Percy D. Peckham and Kenneth D. Hopkins. P. 5.

30. Violating ANOVA assumptions -- problem set. Kenneth D. Hopkins. P. 2.

31. Quiz on violating ANOVA assumptions. 6 test items. P. 2.

32. Analysis of covariance: its nature and uses. William G. Cochran. P. 7.

33. ANCOVA lecture problem. Kenneth D. Hopkins. P. 5.

34. Analysis of covariance - problem sets. Kenneth D. Hopkins. P. 1.

35. ANCOVA computational problem sets. Kenneth D. Hopkins. P. 7.

36. Quiz on ANCOVA. 8 test questions. P. 2.

37. Individual comparisons among means. Jason Millman. P. 7.

38. A schema for proper utilization of multiple comparisons in research and a case study. Kenneth D. Hopkins and Russell A. Chadbourn. P. 6.

39. Worked examples of multiple comparison procedures using data from the Rothkopf study. Jason Millman. P. 4.

40. Problem set on multiple comparisons. Jason Millman. P. 4.

41. Multiple comparisons for correlation coefficients, proportions, and other parameters. Kenneth D. Hopkins. P. 3.

42. Quiz on multiple-comparison procedures. 9 test items. P. 3.

43. Determining causal relationships in socio-psychological inquiry: four techniques. A. H. Yee and N. L. Gage. P. 5.

44. Participant evaluation form. P. 2.

45. Presession critique for staff members. P. 2.

OUTCOMES

A. Subject Matter

At regular intervals during the presession short quizzes were administered. The participants recorded their answers on a separate cover sheet which they handed in. They were then able to keep the test proper while the questions and answers were discussed by the instructional staff.

Unlike previous years, these tests were not mastery examinations. Rather, they were composed of more difficult items which served as a learning experience. Indeed, in some instances the content necessary to know how to answer a question correctly had not yet been provided.

The proportion of participants who answered a given item correctly is shown below.

Test	Item							
	1	2	3	4	5	6	7	8
Intro. - Internal Valid.	58/61	44/61	31/61	18/61	56/61	49/61	19/61	34/61
Interaction - External Valid.	41/64	42/64	53/64	11/64	25/64	13/64	-----	-----
Rules of Thumb	Not Scored							
Violating ANOVA Assump.	50/62	7/62	53/62	41/62	32/62	35/62	-----	-----
ANOVA Quiz	19/63	53/63	26/63	46/63	63/63	42/63	60/63	37/63
Multiple - Comparison Quiz	37/61	47/61	52/61	45/61	42/61	17/61	45/61	18/61

The instructional staff were pleased with the test results in most instances. The participants were not expected to absorb all of the instruction. Rather, it was hoped that the wealth of instructional materials plus the instruction would provide the basis for further study and reference.

As will be seen in the next section, many participants were disappointed that they could not master all the content. Whether future presessions should try to cover less material at a slower pace or not is a real issue which deserves further consideration. (A recommendation on this matter may be found in Section VII-B-5.)

B. Attitudes

A participant and a staff critique form were filled out. The replies to each question on the participant critique sheet are provided below, together with last year's responses whenever the same question was asked.

PARTICIPANT CRITIQUE

1.a. To what extent did the relative availability or unavailability of books and journals interfere with or promote your attempts to master the content of this session?

Thirty-seven respondents said no need for books and journals since content was provided by notebooks of materials. Seven said availability wasn't a question - time to read them was. Ten pointed out that books were not available and might have been helpful.

b. To what extent did reproduced materials given to you by the staff improve matters?

Forty-two respondents replied "Very much." Eleven more also said "very much" but lamented the fact that there wasn't more time to read them. Four replied that some materials were better than others.

2.a. Did you feel that you lacked a "place to work," either alone or in small groups?

Yes - 4; Somewhat - 8; No - 44

Responses to this question last year were:

Yes - 11; No - 43.

2b. Was your room satisfactory?
Yes - 43; Food bad or expensive -- 16
Responses to this question last year were: Yes - 43; No - 11.

3a. Which features of the meeting rooms were inadequate or not conducive to learning?
None - 6; Lighting - 46; Acoustics - 4; Cold - 9;
Table arrangements - 6; Miscellaneous - 2.
Last year, acoustics was the problem most cited.

3b. Which features were especially facilitative in the same regard?
Arrangement of tables - 30; Lighting - 2; Acoustics - 5;
Instructors - 3; Atmosphere - 2; Nothing outstanding - 3.
Last year, space and water were mentioned most often.

4a. Was five days too long a period to leave your work at home for the purpose of attending this session?
No - 47; Yes - 7; Exhausting - 3.
Last year, 39 said No; 15 said Yes.

4b. Was five days too short a period in which to learn much of the content of this session?
No - 30; Yes - 23.
Last year, 24 said No; 27 said Yes.

5a. Were you allowed enough time in which to pursue activities of your own choosing?
No - 19; Yes - 38.
Last year, 25 said No; 28 said Yes.

5b. Would you have preferred not to meet in the evening after dinner?
No - 44; Yes - 8; Sometimes - 9.
Last year, 37 said No; 16 said Yes.

5c. Would you have preferred more or fewer meetings per day than there actually were? Or was the number of meetings per day agreeable to you?
O.K. as is - 47; Fewer - 9.
Last year, 48 said O.K.; 6 said Fewer.

6a. Were the individual lectures too long to sit and listen or take notes?
No - 42; Yes - 5; Sometimes - 7.
Last year, 36 said No; 9 said Yes; 9 said Sometimes.

6b. Were the lectures scheduled in an appropriate sequence?
No - 4; Yes - 48;
Last year, 4 said No; 44 said Yes.

7. Did you have sufficient opportunity to interact with colleagues?
No - 7; Yes - 52.
Last year, 9 said No; 42 said Yes.

8a. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention that you desired?
No - 55; Yes - 2; More assistants needed - 3.
Last year, 52 said No; none said Yes.

8b. Was it helpful to have graduate student assistants present?
No - 2; Yes - 55; Could have been used better - 7.

9. Did the attempts to evaluate your opinions and reactions during the session (and at this moment) interfere with your work here?
No - 55; Yes - 3.
Last year 46 said No, 3 said Yes.

10. In general, was the Presession well organized?
No - 0; Yes - 55; Undecided - 2.
Last year, none said No, 49 said Yes.

11a. Did the content of the lectures and readings presuppose far more previous training than you had?
No - 39; Yes - 13; In some areas - 5.

11b. Should less training in these areas or more have been presupposed?
(Most respondents answered "Yes" or "No" to this question. The meaning meant for these replies is unclear.)

12. To what extent was the content of the lectures and readings relevant to what you had hoped to accomplish during the session?
Relevant - 50; Not relevant - 4; Undecided - 2.
Last year, 48 out of 49 respondents said "Relevant."

13a. Were the lecturers stimulating and interesting?
Yes - 46; Some more than others - 10.
Last year, 49 of 51 respondents said Yes.

13b. Were the lecturers competent to speak on the subject assigned them?
Yes - 48; Some more than others - 7; Undecided - 1.
Last year, 44 said Yes; 7 omitted the question.

13c. Were the lecturers well prepared?
Yes - 42; Some more than others - 14.
Last year 50 out of 51 said Yes.

For questions 15 - 21, last year's frequencies are shown in parentheses when they were available.

15. If you had it to do over again would you apply for the Presession which you have just completed?
Yes: 58 (49) No: 1 (1)

16. If a presession such as this is held again would you recommend to others like you that they attend?
Yes: 59 (51) No: 0 (0)

17. Do you anticipate maintaining some sort of contact with at least one of the Presession staff?
Yes: 38 (43) No: 15 (8) Possibly: 2

18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one?
Yes: 59 (51) No: 0 (0)

19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment?
Yes: 8 (12) No: 51 (39)

20. Is it likely that you will collaborate in research with someone else attending this Presession (other than those you already were likely to collaborate with)?
Yes: 16 (22) No: 42 (27) Doubtful: 0 (2)

21. Do you feel that the staff should feel that it has accomplished its objectives during this five-day presession?

Yes - 56; No - 2

In this listing of responses it was not feasible to indicate all of the qualifications. More often than not, a "yes" or "no" was qualified by such phrases as "great", "very much", "and how", etc. Individual comments included; "This was one of the finest training experiences which I have ever gone through;" "Stimulating, rewarding, and frustrating, all at the same time;" "If I sound effusive it's because I mean it;" and "This was a model for Presessions."

It is not surprising that the participant-reactions were highly similar to those for last year's design presession in view of the overlap of staff and some materials. Perhaps the major negative criticisms (invariably made by a minority of participants) concerned the fast pace of the presession, the lack of material beforehand, the expense of room and board, the poor lighting in the meeting room, and the dissatisfaction with one of the guest instructors. (This latter reaction was, in the main, responsible for the non-positive replies to questions 13a, 13b, and 13c. The director must take responsibility for not structuring the instructor's assignment in enough detail and for letting non-productive discussion get out of hand.)

As for the staff critiques, unsatisfactory checks were placed only after le (resource material, library) and 3f (adequacy of financial support). Poor lighting in the meeting room was also mentioned. Other than these problems, the staff critiques displayed much self satisfaction (perhaps too much so) with those of the graduate assistants being most complimentary.

PRESESSION VI

CONCEPTS, CONTEXT, AND STRATEGIES FOR EVALUATION OF EDUCATIONAL PROGRAMS

Director

Dr. Robert Pace
University of California-Los Angeles

STAFF

Director:

C. Robert Pace
University of California, Los Angeles
UCLA
Department of Education
405 Hilgard
Los Angeles, California 90024

Instructors:

Rodney Skager
UCLA
School of Education
405 Hilgard
Los Angeles, California 90024

Marvin Alkin
UCLA
School of Education
405 Hilgard
Los Angeles, California 90024

Louise Tyler
UCLA
School of Education
405 Hilgard
Los Angeles, California 90024

Daniel Stufflebeam
The Evaluation Center
209 Oxley Hall
1712 Neil Avenue
Columbus, Ohio 43210

Fred Stodtbeck
The University of Chicago
Department of Sociology
1126 East 59th Street
Chicago, Illinois 60637

Graduate Assistant:

J. Eugene Grigsby (Research Assistant)
10128 Regent Street
Los Angeles, California 90034

PARTICIPANTS

Ammentorp, William M. Route 2 Cannon Falls, Minn. 55009	
Anderson, Myron L. Elementary Education Wisconsin State Univ. Oshkosh Oshkosh, Wisconsin 54901	(Regional Lab) Training Elem. Teachers Culturally Deprived
Aronson, Judith S. 100 Arundel Place St. Louis, Mo. 63105	(Fed Projects) Title I-III, Arts
Bach, Jacob Bureau of Elementary & Secondary Educ., Rm 2001 USOE, FOB #6 (also - So. Ill. Univ.) 400 Maryland Ave. SW Wash. D.C. 20202	Consultant
Beisman, Gladys L. 963 Brown Road Rochester, New York, 14622 (Center for Urban Educ.)	(Fed. Projects) Title I-III Urban Education
Bell, Lowell E. 201 E. 38th St. Sioux Falls Public Schools Sioux Falls, South Dakota 57102	(Program Evaluation) Federal Programs
Berman, Laurence H. Testing Services Western Michigan University Kalamazoo, Michigan 49001	(Program Evaluation) School Programs
Bernstein, Allen MOREL, 3750 Woodward Avenue Detroit, Michigan 48201	(Regional Lab) School Eval. Teachers-Students Attitudes
Bisbey, Gerald D. Bureau of Research & Examination Services Univ. of Northern Iowa Cedar Falls, Iowa	(Institutional Evaluation) College Eval.

Bollenbacher, Joan K. Cincinnati Public Schools Division of Evaluation Services 608 East McMillan Street Cincinnati, Ohio 45206	(Program Evaluation) System Wide School Eval.
Brim, Charles W. Dir. Bureau Univ. Research Northern Ill. Univ. DeKalb, Ill. 60115	
Burke, James M. Conn. State Dept. of Ed. 165 Capitol Ave. P.O. Box 2219 Hartford, Connecticut 06115	(Fed. Projects) Title I,III
Carlstrom, Gerard M. 1929 Lakehurst Drive Olympis, Washington 98501	(Program Evaluation) Federal Projects
Carrigan, Patricia M. 1220 Wells Street Ann Arbor, Mich. 48104 (Ann Arbor Public Schools)	(Program Evaluation) School Programs
Cawelti, Gordon L. 5454 South Shore Drive Chicago, Ill. 60615 (North Central Assoc.)	(Institutional Evaluation)
Coffin, Edwin C. Monterey County Office of Ed. P.O. Box 851 Salinas, Calif. 93901 Superintendent	(Fed. Projects) Title I-III
Conry, Robert F. Instructional Research Lab. 202 State St. Madison, Wisconsin 53706 (Univ. of Wisconsin)	(Fed. Projects) Title I, III
Cooper, Homer C. Social Science Research Instit. Univ. of Georgia Athens, Georgia 30601	(Fed. Projects) Title I, III

Cooper, Mildred Pivetz
214 N. Irving Street
Arlington, Virginia 22201
(District of Columbia)
(Fed. Projects)
Title I-III

Cortright Richard W.
4805 Crescent Street
Washington, D.C. 20016
(Adult Education)

Curtin, John T.
21761 Mauer Dr.
St. Clair Shores, Mich. 48080
(Detroit Public Schools)
(Fed. Projects)
Title I,III

Dickens, Charles H.
Office of Assoc. Dir. (Ed.)
Natl. Science Foundation Rm.622
Washington, D.C. 20550
(Educational Program)

Doepke, Mrs. Loretta O.
2360 Camelot Drive
Brookfield, Wisconsin 53005
(Milwaukee Public Schools)
(Fed. Projects)
Title I-III

Dolan, G. Keith
5500 State College Parkway
San Bernardino, Calif. 92407
(State College)
(Program Evaluation)
Educ. Programs

Eagle, Norman
Education Center,
Mt. Vernon Pub. Schools
165 N. Columbus Ave.
Mount Vernon, New York
(Program Evaluation)
Educational Programs

Edwards, Pauline
177 Drexel Ave.
Lansdowne, Penn. 19050
(Abington, Pa.) ?
(Fed. Projects)
Title III
Indiv. Instruction

Elwell, Albert R.
Denbow Road
Durham, New Hampshire 03824
(Univ. of New Hampshire)
(Program Evaluation)
O.E.O.

Flocco, Edward C. 65 Jesup Rd. Board of Ed. Westport, Conn. (Westport Public Schools)	(Program Evaluation)
Flottmann 2812 Pine Mattoon, Ill. 61938	(Fed. Projects) Title I-III
Fortune, Jim C. Bureau of Ed Research & Servs. Memphis State University Memphis, Tennessee 38111	(Program Evaluation)
Freytes, Fanny C. Div. of Eval-Edpt. of Education Hato Rey, Puerto Rico	(Fed. Projects Title I-III
Hefferlin, JB L. Instit. of Higher Education Box 101, Teacher College Columbia Univ. New York N.Y. 10027 (Teachers College, Columbia)	(Program Evaluation) Educ. Programs
Hitch, Kenneth S. Colonel USA Inductrial College of the Armed Forces Fort McNair, Wash. DC	(Program Evaluation)
House, Ernest R. Cooperative Educational Research Lab. Box 815, Northfield, Ill. 60093	(Gifted)
Hunter, Larry O. Research & Infor. Servs.Div. Unified School Dist. #259 428 So. Broadway, Wichita, Kansas 67202	(Fed. Projects) Title I-III
Iwamoto, David US Office of Education 400 Maryland Avenue S.W. Washington, D.C. 20202	(Fed. Projects) Title I-II-III
Jenkinson, Marion E. Ontario Instit. For Studies in Education 102 Bloor St. W. Toronto, 5, Canada	

Johnson, Thomas P. 3820 Berkeley Drive, #3 Grand Forks, North Dakota 58201 (Univ. of North Dakota)	(Fed. Projects) Title I-III
Kendig, Thomas E. Div. School Eval. Rm 539 Ed. Bldg. P1O. Box 911 Harrisburg, Penn, 17126 (Dept. of Public Inst.)	(Program Evaluation) School Programs
Krahmer, Edward F. Bureau Ed. Research, Univ. of North Dakota Grand Forks, N.D. 58201	(Fed. Projects) Title I-III
Laing, James M. 75 Santa Barbara Road Pleasant Hill,Calif. 94523	(Fed. Projects) Title I-III Educ. Planning
Lankton, Robert S. Research & Dev. Detroit Pub. School 5057 Woodward Detroit, Michigan 48202	(Program Evaluation) School Evaluation
Lewy, Rafael A. 710 E. Algonquin, Apt. 111 Arlington Heights, Ill. 60005	(Indiv. Pres. Inst.)
Mahan, David J. 6733 West Park St. Louis, Missouri 63139	(Title III)
Mazur, Joseph L. 1055 Clifdale Lakewood, Ohio 44107 (Cleveland Public Schools)	(Program Evaluation) Fed. Projects
McAshan, Hildreth H. 2036 NW 18th Lane Gainesville, Florida 32601 (Reg. Lab)	(Fed. Projects) Title I-III
McCallon, Earl L. P.O. Box 13871 North Texas State Univ. Denton, Texas 76203	(Fed. Projects) Title I-III

McDonald, Arthur S. 2 Richards Dr. Dartmouth Nova Scotia, Canada	(Pupil Personnel)
Meinke, Dean L. 15 South Fawn Drive Terre Haute, Indiana (Indiana State Univ.)	(Fed. Projects) Title I-III
Meredith, Gerald M. East-West Center 1777 East-West Road Honolulu, Hawaii 96822 (University of Hawaii)	(Institutional Evaluation) Institutional Evaluation
Miller, Harold J. 713 Northwest Drive Grand Forks, North Dakota 58201 Univ. of North Dakota	(Fed. Projects) Title I-III
Morris, Earl W. 103 S. Washington St. Carbondale, Ill Regional Lab	(Program Evaluation) School Programs
Nearine, Robert J. Board of Education 249 High Street Hartford, Conn, 06103 (Hartford Public Schools)	(Program Evaluation) Federal Projects
Neiman, Albert M. Ofs. of Supt. Bucks County School 110-A Chapman Lane Doylestown, Pa.	(Program Evaluation)
Nelson, Dr. A.K. Natl. Old Line Bldg - SCREL Little Rock, Ark. (Regional Lab)	(Regional Lab) Program Evaluation
Olson, LeRoy A. Office of Evaluation Services Michigan State Univ. East Lansing, Michigan	(Institutional Evaluation) Coll. Evaluation

Olson, Merline H.
Ninth District Ed. Services
Center
P.O. Box 1075
Gainesville, Georgia 30501
(Fed. Projects)
Title III Evaluation

Petersen, Dwain F.
P.O. Box 75 Mankato State College
Mankato, Minn. 56001
(Institutional Evaluation)
Institutional Evaluation

Preising, Paul P.
632 St. Claire
Palo Alto, California
(Stanford)
(Program Evaluation)

Pugh, Richard C.
401 Eastside Drive
Bloomington, Indiana 47401
(Indiana Univ.
(Institutional Evaluation)

Rowe, G. Dwight
Milwaukee Public Schools
5225 W. Vliet Street
Milwaukee, Wis.

Puzzuoli, David Anthony
Ed. Research & Field Services
West Virginia Univ.
Oglebay Hall Annex
Morgantown W. Va. 26501
(Program Evaluation)

Rossmann, Jack E.
465 Vermont Ave.
Berkeley, Calif. 94707
(U.C.B.)
(Institutional Evaluation)

Rowe
(Federal Projects)
Title 1,III

Satterfield, Christina Heitlinger
Project Reachigh
Route #6
Clarksville, Tenn.
(Peabody College)
(Federal Projects)
Title 1-III

Schultz, Kenneth M.
466 West 41 Place
Hialeah, Florida 33012
(Dade County)
(Program Evaluation)

Shea, James E. 1549 Wyoming Ave. Schenectady 9, N.Y. 12309 Teachers Assoc. (N.Y.)	(Teachers Assoc.)
Shedd, A. Neal 400 Maryland Ave. S.W. Rm 2177 Washington, D.C. 20202	(Fed. Projects)
Sheverbush, Robert L. 1115 N. El Paso St. Colo. Springs, Colo.	(Program Evaluation)
Simmer, Lowell W. Elk Grove Training & Dev. Center 1706 Algonquin Rd. Arlington Hts. Ill.	(Fed. Projects) Title I-III
Stallings, William M. 507 E. Daniel Champaign, Ill. 61820 Univ. of Ill.	(Institutional Evaluation)
Stanley, William H. El Centro College Main at Lamar Dallas, Texas	(Institutional Evaluation)
Stordahl, Kalmer E. Northern Michigan Univ. Marquette, Mich.	(Institutional Evaluation)
Tobiason, Ray 109 East Pioneer, Puyallup Washington 98371	(Program Evaluation) School Evaluation
Van Engen, Henry School Educ. University of Wisconsin Madison, Wis.	(Arith. Eval.)

Virgin, Albert E.
61 Inverlochy Blvd
Suite 2
Thornhill, Ontario
(North York Board of Ed.)
(Program Evaluation)

Wagoner, Ralph Howard
Drake University
College of Education
26th & University
DesMoines, Ia.
(Teacher Effect)

Wallace, Gaylen R.
9857 Telegraph Rd., Apt 8
Lanham, Maryland
U.S.O.E.
(Title I-III)
Federal Projects

Ward, Beatrice A.
Project EDINN
Box EDINN
Monterey, Calif. 93940
(Fed. Projects)
Title I-III

Warmbrod, J. Robert
Center Voc. Tech Ed.
The Ohio State Univ.
980 Kinnear Rd.
Columbus, Ohio 43212
(Vocational - Tech.)

Whiteside, Ray
ACC Station, Box 576
Abilene, Texas 79601
Abilene Christian College
(Institutional Evaluation)

Wigderson, Harry I.
1500 So. Mooney Blvd.
Visalia, Calif. 93277
(Fed Projects)
Title I-III

Williams, Lois Q.
1300 Westview
East Lansing, Mich. 48823

Williams, Wilbur A.
Dept. Educ.
Eastern Michigan Univ.
Ypsilanti, Michigan 48197
(Institutional Evaluation)

Wilson, James W.
Rochester Institute of Tech.
Rochester, New York 14608
(Institutional Evaluation)

Wrightsman, Shirley Office Univ. Research Box 820 Fisk Univ. Nashville, Tenn. 37203	Institutional Evaluation)
Yarborough, Betty H. Chesapeake Public Schools Administration Building Chesapeake, Virginia	(Fed. Projects) Title I-III

DESCRIPTION OF PARTICIPANTS AND THEIR NEEDS

Of the completed application blanks and the evaluation report form, the following can be reported:

I. Present Institution Affiliation of Participants

28	Universities (Private or Public)
26	School Districts (City or County)
8	Governmental Organizations
6	Title III Centers
5	Regional Laboratories
5	Colleges
4	State Departments of Education
2	Professional Organizations (N.E.A.)
1	Accreditation Organization
1	Research Laboratory
1	State Superintendent of Public Institution

II. Kinds of Projects Participants were Interested in Evaluating

16	Title I, III
5	Impact of colleges on students
4	School programs
2	Teaching effectiveness -

Teacher behavior
Medical education
Gifted
Individually prescribed instruction
Impact of the East-West Center
Federal programs
Arithmetic
High Schools
Urban education

III. Participants Needs were Varied - for example:

21	Knowledge of evaluation
9	Knowledge of evaluation design
7	Techniques for designing instruments
6	Design models for evaluation
5	Knowledge of evaluation models
4	Statistical procedures
3	Application of evaluation principles to a specific project
3	Sampling and scaling techniques
2	Attitude measurement
2	Skills in developing instruments that get at affective domain
-	Use of pictures, slides for evaluation purposes
-	How to make evaluation more than a number game
-	Ability to see what is to be evaluated
-	Problem of consumption of feedback data
-	A researcher handbook
-	Criteria for selection of instruments
-	Evaluation of long range objectives
-	Skills for evaluating effectiveness of college programs
-	Methods for dealing with non-quantitative data
-	Knowledge of what's new in computer technology
-	Research techniques and treatment of data
-	Application of CIPP model
-	Creative approaches to evaluation

III. Participants Needs were Varied (con't)

- Computer use in multivariate analysis
- Responsibility of personnel in a public school evaluation
- Good examples that can be graphically and pictorially disseminated
- Constructing decision models

TENTATIVE PRESESSION SCHEDULE

February 3-7, 1968

Sat. Feb. 3	1:30 - 2:00	Introductions, plans, etc.	
	2:00 - 2:45	Tyler-report on participants interests and problems.	
	2:45 - 3:00	Intermission	
	3:00 - 4:00	Pace-speech "Evaluation Perspectives: "68"	
	4:00 - 5:00	Individual and group discussions among staff and participants	
	5:00 - 7:00	Social hour.	
Sun. Feb. 4	9:30 - 10:30	Staff panel	Alkin, Skager, Stufflebeam, and Pace presentation of various views and concepts about evaluation: for example--formative, summative, product testing, quality control, etc.
	10:30 - 10:45	Intermission	
	10:45 - 12:15	Staff panel continued	
	1:30 - 4:00	Presentation of the concepts, methods, and instruments being developed at the UCLA R & D Center for the Study of Evaluation of Instructional Programs. Pace, Alkin, Skager	
	4:00 - 5:00	Individual and group discussion among staff and participants.	
Mon. Feb. 5	9:00 - 10:30	Stufflebeam-presentation of the concepts, methods, etc. being developed at the Evaluation Center, Ohio State U.	
	10:30 - 10:45	Intermission	
	10:45 - 12:00	Alkin-cost benefits and systems approaches to evaluation.	
	1:30 - 2:30	Skager-measurement and design problems in evaluation.	
	2:30 - 2:45	Intermission	
	2:45 - 4:00	Strodtback-sociological and societal problems in evaluation.	
	4:00 - 5:00	Individual and group discussion among staff and participants.	
Tues. Feb. 6	9:00 - noon	Interest groups. Our tentative thoughts about possible interest groups are as follows: Strodtback - culturally deprived Skager - testing and measurement Stufflebeam - evaluation processes and procedures Alkin - systems approaches to evaluation Pace - evaluation problems in higher education	
	1:30 - 4:00	Alkin - presentation of a simulated evaluation problem.	
	4:00 - 5:00	Individual and group discussion among staff and participants.	
Wed. Feb. 7	9:00 - noon	To be arranged, except that a portion of the time will be reserved for participant evaluation of the presession.	
	1:30 - 2:30	Pace - summary, priorities for the advancement of evaluation.	

REVISED SCHEDULE OF ACTIVITIES

Saturday, February 3rd

1:00 - 1:45 Introduction - plans, etc.

2:00 - 2:10 Tyler - Report on Participants' Interests

2:30 - 3:30 Pace - Lecture on Perspectives

3:30 - 4;45 Skager - Discussion of Interests Groups

5:00 - 7:00 Social Hour

Sunday, February 4th

A.M. Staff Panel - Questions on Evaluation

Stufflebeam, Skager, Pace, Tyler
What is Evaluation?
Criteria for Evaluation?

Evaluation in Higher Education - Pace

P.M. Alkin - UCLA Models of Evaluation

Interests Groups

Stufflebeam - CIPP

Skager - Testing and Research Design in Evaluation

Pace - Higher Education

Alkin - Cost Benefit Analysis and Organization Variables

Monday, February 5th

A.M. Skager - General Considerations of Data Collection - Emphasizing Testing Problems

Stufflebeam - CIPP Model

P.M. Alkin - Simulation Problem

Tuesday, February 6th

A.M. Strodtbeck - Cultural Deprivation

Skager - Measurement of Change

P.M. Simulation Problem - Final Reports

Tyler - Behavioral Objectives

Alkin - Cost Benefit Analysis

Wednesday, February 7th

A.M. Skager - Item Sampling Methodology

Special Interests Groups

- Pace - Higher Education
- Skager - Change Sensitive Test
- Stufflebeam - Evaluation
- Alkin - Systems Analysis

PRESESSION MATERIALS

1. Report and Analysis of an Evaluation Study
2. Form for Re-analysis of Your Evaluation
3. The Use and Abuse of Evaluation in Title III By Daniel S. Stufflebeam
4. Course Improvement Through Evaluation By Lee J. Cronbach
5. The Countenance of Educational Evaluation By Robert E. Stake
6. AERA Monograph Series on Curriculum Evaluation: Perspectives of Curriculum Evaluation (1) By Ralph Tyler, Robert Gagne, Michael Scriven
7. Tentative Pre-session Schedule
8. Evaluation Perspective: 68 By C. Robert Pace
9. Letter of Acceptance with Hotel Reservation Card enclosed
10. AERA 1968 Research Training Pressions Program Participant Evaluation Form
11. Presession Applicant List 1968

PRESESSION CRITIQUE FOR STAFF MEMBERS

Indicate your observation and judgment by checking each item in one column at the left. Items not applicable or not subject to your observation should be omitted. Be frank.

Commendable	Satisfactory	Unsatisfactory	
			1. Environmental conditions
	[illegible]	[illegible]	a. Classroom spaces
	1	[illegible]	b. Work spaces
[illegible]	[illegible]		c. Living quarters
	[illegible]	[illegible]	d. Teaching equipment, aids (chalk boards, public address system, etc.)
[illegible]	[illegible]		e. Resource material, library
	[illegible]		f. Eating facilities
			2. Participants
[illegible]	[illegible]		a. Appropriateness of academic backgrounds
[illegible]	[illegible]		b. Sufficiency of research experience
[illegible]	1		c. Willingness to work
[illegible]	[illegible]		d. Intellectual curiosity
[illegible]			e. Concern for applicability of techniques
[illegible]	[illegible]		f. Aspiration
[illegible]	[illegible]		g. Immediate preparation for Presession
			3. Organization
	3	1	a. Adequacy of notice to prospective applicants
	[illegible]	[illegible]	b. Sufficiency of preplanning
	[illegible]	[illegible]	c. Smoothness of operation
[illegible]			d. Adaptability to obstacles and feedback
5	1		e. Sensitivity to grievences
[illegible]	[illegible]	1	f. Adequacy of financial support
			4. Schedule
1	5		a. Appropriateness of five days for the job
	[illegible]	1	b. Time spent efficiently
	[illegible]	[illegible]	c. Events sequenced appropriately
	6		d. Punctuality
	[illegible]		e. Balance between formal, informal affairs
	[illegible]		f. Quantity of discussions
	6		g. Quality of discussions
1	[illegible]		h. Quality of formal presentations
1	[illegible]		i. Unobtrusiveness of evaluation efforts
[illegible]	[illegible]	[illegible]	j. Methods of evaluation
			5. Outcomes
	6		a. Intended content was actually taught
1	[illegible]	1	b. Increase in participant understanding
	[illegible]	1	c. Improvement in attitude toward research
[illegible]	[illegible]		d. Personal associations initiated

6. In general was the Presession well organized?

yes: 2 no: 2 [because of changes in plans]

7. Were the facilities suitable for the activities which you had planned? If not, specify.

no: 6 [too small, too hot; not enough small group space; (1) needed better audio-visual equipment)]

8. Should Pressions be limited to the same hotel, or the same city, in which the annual meetings will be held?
same hotel: no: 1 yes: 3 same city: yes: 1 no: 2

9. Were you to do the same assignment over, in what major ways, if any, would you change your contribution?

individual answers

10. Do you wish that the Director had made firmer arrangements to assure participants and you of the staff opportunity to meet in pairs or small groups?

2 as much as possible was done
1 was done
1 yes
2 not necessary

11. Were the objectives you set for yourself during the Presession attained?
yes: 5 no: 1

12. Are you inclined to urge your colleagues to become staff members for such an institute or Presession?
yes: 5 no: 1 [unless there is adequate preplanning]

13. In what ways, if any, did you as a staff member benefit personally as a result of your participation in this Presession?

individual

PARTICIPANT EVALUATION FORM

1.a. To what extent did the relative availability or unavailability of books and journals interfere with or promote your attempts to master the content of this session?

General consensus was that the unavailability of books and journals did not interfere with attempts to master the content of the session.

FREQUENCY COUNT

None or very little........	25
Not applicable.............	9
No response................	6

One person would have liked to have reference books available to browse. Two persons stated that no books were available and that was their only response.

b. To what extent did reproduced materials given to you by the staff improve matters?

General consensus seemed to be that what was available was helpful but that more material was needed. The most extensive comment made details the ambivalence felt by most of the respondents: "Stufflebeam's paper was excellent. Simulation materials helpful--except complete sets not available except to 'group chairmen.' Majority of presentations, especially on UCLA R & D Center activities should have been reproduced and distributed rather than read--tremendous waste of time. Also, group reports could have easily been reproduced. Finally, several participants expressed interest in acquiring p. 1 of "Assignment I" from fellow participants--this could have easily been produced in advance by the staff. The lecture method was time-consuming--bulk of lectures could have been reproduced."

FREQUENCY COUNT

Very helpful.........	15
Moderately...........	4
Somewhat.............	13
Very little..........	8
None was available..	1
No Response..........	2

2.a. Did you feel that you lacked a "place to work," either alone or in small groups?

FREQUENCY COUNT

Adequate..............	35
Inadequate............	8

Elaborations on the responses stating that the facilities were inadequate included the following: Too small and too poorly ventilated; didn't know what part of the facilities was supposed to be used at any given time.

b. Was your room satisfactory?

General response was "yes" without qualification. When a "no" response was given the following criticisms were made: Too small as a meeting room; bad but corrections were made; too crowded; too hot.

FREQUENCY COUNT

Yes..........	27
No...........	16

3.a. Which features of the meeting rooms were inadequate or not conducive to learning?

FREQUENCY COUNT

Shape of room wrong.........................	2
Size of the room too small for group........	31
Ventilation bad, too hot and/or too cold, and too stuffy..................	21
Too noisy.................................	3
Not adequately equipped for the type of meeting............................	4
1) lighting bad	
2) No place for note taking, no table space	
3) Not enough chairs	
No Response................................	4
Irrelevant Response........................	1

b. Which features were especially facilitative in the same regard?

FREQUENCY COUNT

No Response................................	21
Another point in time was better, the room was re-arranged or changed to one more adequate.............	8
Sense of community.........................	1
Good Lighting..............................	3
Rooms all in same hotel....................	1
PA system available........................	1
Chalkboard available.......................	1
Comfortable seats..........................	1
Smaller groups.............................	1
None.......................................	6

AERA Presession Evaluation
Scheduling and Organization

Note There were 43 questionnaires completed but many individuals did not respond to every item. Many of the items, therefore, do not have 43 responses. The number of responses are reported rather than percentages of the total. No assumptions are made regarding non responses.

4.a. Was five days too long a period to leave your work at home for the purpose of attending this session?

4a. Five days away from their work was not too long for 29 participants but it was too long for 11. A few individuals indicated that 3 or 4 days would have been adequate.

b. Was five days too short a period in which to learn much of the content of this session?

b. 34 participants felt that 5 days was not too short a time to learn the content of the session. Only two participants felt it to be too short.

5.a. Were you allowed enough time in which to pursue activities of your own choosing?

5a. Most respondents felt that enough time was allowed for activities of their own choosing (31) but 9 felt there was not enough time.

b. Would you have preferred not to meet in the evening after dinner?

b. There was much confusion about evening meetings and 22 indicated that the question was not relevant since there were no evening meetings. Eight people indicated that they would like to have met in the evenings and four said they would not want to have evening meetings.

c. Would you have preferred more or fewer meetings per day than there actually were? Or was the number of meetings per day agreeable to you?

c. 28 persons said that the number of meetings per day was O.K. Responses to the first part of the question were confusing since a yes or no did not qualify whether more or fewer meetings per day were preferred.

6.a. Were the individual lectures too long to sit and listen or take notes?

6a. 26 persons indicated that the lectures were not too long, 9 indicated they were too long, and 5 indicated they were sometimes too long. The suggestion was made that a variety of media would have been better.

b. Were the lectures scheduled in an appropriate sequence?

b. Personal opinion was split 14 to 14 on the appropriate sequencing of the lectures. Four others said it was as appropriate as it could be and 5 persons said it was unimportant.

7. Did you have sufficient opportunities to interact with other participants?

7a. Thairty-two participants had sufficient opportunity to interact with others and seven said there was not enough opportunity. It was suggested that "an activity to break the ice, working in small groups the first morning, would have enhanced the interaction."

8.a. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention that you desired?

8a Thirty-five persons felt the instructors were approachable and accessible. Only six persons felt they were not accessible.

b. Was it helpful to have graduate students assistants present?

b. Most people were amazed at this question. One respondent boldly said there were NO graduate students present and six asked if there were any present. Someone remarked that he wasn't utilized enough aand several indicated that he may have helped the staff but he didn't help them. Five people said he wasn't helpful and the majority of people were quite indifferent about the question.

9. Did the attempts to evaluate your progress and reactions during the session (and at this moment) interfere with your work here?

9a. Thirty-four people indicated that the evaluation did not interfere with their work. Comments like the following were also made. "Did not like repeating assessment." "None made." "This one is fine but the several page one was ridiculous." "Would have preferred more on-going evaluation."

10. In general, was the Presession well organized?

10a Twenty-two participants felt that the Session was not well organized and eleven thought it was well organized. Several comments were made about the weak beginning and the changes that were always being made.
Item 4a and 10 were brought together in the following statements. Regarding five days away from work: —

"Not if preparation for this presession had been effective. One day was lost in organizing. This could have been reduced,to 30 minutes with adequate pre-planning."

From the same point of view: ---

"No, although real content of this session could easily have been covered in three days if "lecture" materials had been printed and distributed."

AERA Presession Evaluation
Content and Presentation

11.a. Did the content of the lectures and readings presuppose far more previous training than you had?

11a. Most respondents (36) felt that the content of lectures and readings did not presuppose more training than they had previously. Five respondents believed that their previous training had not adequately prepared them for the lectures and readings.

11.b. Should less training in these areas or more have been presupposed?

b. Most respondents (24) thought that the level presupposed training was adequate. Seven felt that more training should have been presupposed; two felt that less training should have been presupposed; and four didn't know.

12. To what extent was the content of the lectures and readings relevant to what you hoped to accomplish during the session?

12a. The relevance of the content of the lectures and readings was rated very relevant by 19 respondents, moderately relevant by 13 respondents, and not relevant by five respondents.

13.a. Were the lectures stimulating and interesting?

13a. The lectures were thought to be stimulating and interesting by 26 respondents, only moderately stimulating by 12 respondents, and not stimulating or interesting by 2 respondents.

13.b. Were the lecturers competent to speak on the subject assigned them?

b. The competence of the lecturers was clearly acknowledged by 39 respondents and questioned by 2 respondents.

13.c. Were the lecturers well prepared?

c. The lectures were considered well prepared by 28 respondents, only moderately well prepared by 8 respondents, and not at all well prepared by 6 respondents. Skager's presentation was mentioned as a particularly well prepared lecture.

14. Were you disappointed in any way with the group of participants?

14a. Most respondents (28) were not disappointed with the group of participants, 6 were moderately disappointed, and 3 were quite disappointed. Among the latter two categories, the typical comment was that the group was far too diverse. One respondent suggested that a smaller, more heterogeneous group should have been selected.

15. If you had it to do over again would you apply for this Presession which you have just completed?

15a. While 28 participants indicated that they would apply for the Presession if they had it to do over again, 13 participants indicated that they would not.

16. If a presession such as this is held again would you recommend to others like you that they attend?

16a. Yes = 27 No = 12 Don't know = 2

17. Do you anticipate maintaining some sort of contact with at least one of the Presession staff?

17a. Yes = 35 No = 6

18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one?

18a. Yes = 36 No = 3

19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment?

19a. Yes = 5 No = 33 Don't know = 3

20. Is it likely that you will collaborate in research with someone else attending this Presession (other than those you already were likely to collaborate with)?

20a. Yes = 16 No = 20 Don't know = 2

21. Do you feel that the staff should feel that it has accomplished its objectives during this five-day presession?

21a. Yes = 25 No = 14 Don't know = 2

Those who responded "yes" to this item typically had no further comment. Those who responded negatively often had some additional thoughts. Six of those who responded negatively felt that the objectives had not been clearly stated,hence, they could not decide whether the staff had achieved its objectives. The following were typical of the negative comments:

"...if this conference represents the state of the art of evaluation, may God help the schools."

"...I felt frustrated and bored waiting for the staff to organize its material...this was not my first presession."

"...Valuable time wasted in mechanics of organizing the presession ...time robbed from small group participation time."

Positive comments included:

"...Dr. Pace and others did a fine job."

"...Evaluation presession staff were great."

EVALUATION OF PARTICIPANTS STUDIES

Before coming to the UCLA Pre-Session on Evaluation, participants were asked to respond to a number of questions about evaluation studies in which they were actively engaged. Specifically, these questions were: (1) "Describe a program you are now evaluating (or have some part in evaluating) its nature, content, scope, purposes, etc." (2) "what sorts of data (information) are you collecting (have collected) and how did they relate to the evaluation purposes?" (3) "What problems, difficulties, etc., (procedural, organizational, analytical) are you encountering and how are you dealing with them?" (4) "What sorts of conclusions are you drawing, or hope to draw, from your evaluation? And what benefits (changes, decisions, etc.) and for or by whom, do you hope will result?" (5) "What skills, knowledge, etc., about evaluation do you think you need in order to carry out your role more effectively?"

Participants who had failed to respond to this request before the pre-session began were urged to do so at the first meeting. The staff was thus able to obtain the information from all but about ten of the eighty-seven participants. It was obvious that all or nearly all of the participants were active in some sort of evaluation research.

At the close of the pre-session, participants were asked to answer the same questions a second time, but this time indicating any changes in the conception or design of their evaluation study traceable to the pre-session experience. Forty-nine of the participants responded to this request. These responses, discursive in form, were analyzed for instances in which topics presented during a pre-session were mentioned. The pre-session topics are listed below in order of the frequency they were cited. The number in parenthesis following each topic indicates the number of such citations.

INCORPORATION OF PROCESS OR FEEDBACK DATA (25): References, in one form or another, to the need for some sort of monitoring of developmental phases of instructional programs. In the main, these comments referred specifically to the "process" aspect of the CIPP model presented by Stufflebeam.

ITEM SAMPLING (24): This topic refers to methods of data collection proposed by Frederic Lord and designed to permit simultaneous sampling of subjects and test items. Item sampling methods have particular appeal in evaluation research by providing for the coverage of a wide domain of test content coupled with a highly economical expenditure of examinee time.

BEHAVIORAL OBJECTIVES (13): An indication of the need for specifying instructional objectives in behavioral terms as a part of evaluation research.

ANALYSIS OF CHANGE SCORES (12): An indication of increased awareness of the importance of using appropriate methods of data analysis when studying change in individual performance in the evaluation of programs of instruction.

CONSTRUCTION OF "RELEVANT" TESTS (8): This category includes explicit recognition of the limitations of standardized achievement tests in the evaluation of instruction and increased knowledge as to procedures for constructing local tests.

COST EFFECTIVENESS (6): Recognition of the need to interpret evaluation data in the light of economic considerations.

CONTEXTUAL VARIABLES (6): Recognition that instructional outcomes must be interpreted in terms of societal, organizational, and other forces that moderate their effects.

LIMITATIONS OF "TRUE" EXPERIMENTAL DESIGNS (5): Indications that the requirements of rigorous laboratory research often cannot be met under conditions imposed on the typical local evaluation study.

MISCELLANEOUS: Occasional references were made to additional topics discussed during the pre-session. These included references to the "hidden curriculum" (Strodbeck), profile analysis, measuring student and teacher attitudes, relevance of simulation methods in evaluation, the use of time logs of activities, and the desire to give a feedback from the pre-session to members of local staffs.

The topics mentioned above provide an ordering with respect to perceived importance of the conceptual and methodological concerns of evaluation researchers attending the pre-session. As far as the information derived from these reconsiderations of local evaluation studies was concerned, there were very few references to topics that were not included in the pre-session. One participant mentioned a need for knowledge of computer techniques, and three individuals suggested that they needed greater knowledge of statistics. While these data indicate as to the relative importance of the various topics included in the pre-session, they do not give us a great deal of information about topics that should be included in future training sessions.

R.W.S.

RWS:er

UNOBSTRUSIVE MEASURES

The staff members have had many letter from participants and from individuals who heard about the pre-session.

Following are some of the requests:

Skager - Requests for reprints
request for exchanging data
requests for consulting

Alkin - requests for sharing articles
requests for simulation materials
U.S.O.E. (Dr. Shedd) wishes our R & D center to further develop simulation materials so it can be used to train Title III project directors

Tyler - request for planning add teaching workshop for teachers in State of Connecticut, (Burke)
request for material on objectives

Pace - request for speech
request for all materials used
many letters of thanks

DIRECTOR'S NARRATIVE REPORT

In proposing and planning the presession, our general orientation was, I think, something like the following: evaluation is widespread; evaluation is in a state of flux; a great variety of activities are called evaluation with little commonality in vocabulary or concepts; many of us in the R & D Center at UCLA had given a good deal of thought to ways in which the concept and practice of evaluation might be improved; an exchange of viewpoints and an effort to clarify and expand major problems and needed new directions should be generally useful for the field.

We selected participants who were responsible for evaluation programs or who, in other ways, were facing practical evaluation problems.

During the first day and a half, we sensed that our presentations were too theoretical. We had presented, and tried to generate discussions of, such matters as the difference between formative and summative evaluation, between process and produce, the role of the evaluator, the CIPP model for evaluation, the meaning of "contextual" variables, etc. For the last three days we shifted to an emphasis that was, alternately, more practical and more technical. We had developed a "simulation" problem for the presession, and this proved, I think, to be quite successful. It should have been scheduled earlier in the program, partly because it helped to illuminate some of the sticky problems evaluators face, and partly because it got people working on and talking about a common task. We also had small groups meet to discuss special problems--people doing evaluation in higher education, for example. Had space been available we would have had more small group sessions, for in these smaller groups the participants had a better chance to raise questions and discuss possible solutions. We also had some straightforward presentations of measurement and methodological topics--such as criterion-based tests, item sampling, change scores, and change-sensitive tests. These presentations were, I believe, informative and helpful.

By the end of the five days, we had done most of what we had intended to do. If we were doing it again, I think we would spend more time on simulated problems, more time on technical problems, less time talking about concepts and points of view, provide more time for individual conferences with staff members, and more time for special interest groups.

I suspect that any presession on a topic as general as "evaluation" will attract a heterogeneous group of participants--at least more so than some well defined technical topic would attract. I believe that some AERA presessions should be organized around these more general problem areas, but perhaps one should think of them as symposia or workshops rather than as a training program.

PRESESSION VII

THE COMPUTER AND NATURAL LANGUAGE

Director

Dr. Ellis B. Page
University of Connecticut

INTRODUCTION

Each year prior to the annual meeting, the American Educational Research Association sponsors a series of five-day workshops or presessions. Supported through a grant from the United States Office of Education, no tuition charges are levied against the participants. This report describes one such presession -- Presession number 7: The Computer and Natural Language. Under the leadership of Ellis B. Page, he, and eight other staff members presented various natural language computing strategies to 27 participants. The content of the presession ranged from general "state of the art" reviews, to specific, and relatively technical, natural language computing applications.

This brief introduction is followed by a general description of the organization of the presession. Specific objectives as well as the general content outline will be presented. The unique contributions made by each of the nine staff members in the presentation of the content will be cited. And a list of reproduced materials distributed to the participants is also included.

This is followed by a description of the 27 participants of the presession. After a brief consideration of the criteria used by the staff in selecting participants, and after a listing of their names and addresses, several tables are presented which serve to describe the general characteristics of the group.

The fourth part of this report presents some of the results of various formative and evaluative instruments which were administered to the participants throughout the five days of the presession. Also included are the results obtained from a questionnaire asking the staff's reaction to how well the objectives of the session had been met.

In conclusion, this report contains some of the Director's own reactions to the presession and suggests some of the changes which ought to be incorporated in future meetings of this kind.

ORGANIZATION AND CONTENT OF THE PRESESSION

Before we consider the objectives and the content of this presession, let us turn to some of the rationale on which the objectives and the selection of the content was based.

Since ancient times, the main line of Western scholarship has centered around the analysis, transformation, and production of written language. This remains largely true today, in the fields loosely termed the "Humanities", and it remains equally true in those educational studies usually regarded as "less scientific": philosophy, history, administration, curriculum, and various subject-matter teaching fields. Until very recently, such fields have lacked the tools and techniques and concepts necessary for large-scale, reliable, and inexpensive analysis of language; and high-level, valid generalizations and predictions have thus been difficult to make. Largely as a result of these restrictions, the traditional fields of verbal scholarship have been left far behind during the accelerating advancement of the sciences.

Recent development in computer science, however, make possible a revolution in verbal scholarship, and suggest radical changes in the scope and depth of certain kinds of educational research. The softer areas of professional education (such as educational history and philosophy) may be made much more researchable by the application of computer techniques to verbal data. Educational administration may be much increased in rigor by the analysis of laws, codes, decisions, board deliberations, etc. Guidance may be made much more effective through automatic access to large verbal data bases and high-speed retrieval techniques. Perhaps most promising of all, the writings of students themselves may become subject to analysis, amendment, and evaluation, both in batch-processing and in conversation-mode employment of computers.

Even those behavioral researchers who use computers regularly, however, are unlikely to understand their employment with verbal data, or to be familiar with the work in artificial intelligence, computational linguistics, and other fields, which has already gone on. This five-day presession, therefore, aims at introducing able and active researchers, and research teachers, to the concepts, skills, problems, and accomplishments of natural-language analysis. The eventual outcome expected is that they will do research using natural-language analysis, will be able to help researchers in the softer areas perform such analysis, and will teach such research techniques to students and faculty in their own regions and institutions. In this way, an effective and virtually new area of educational research will be opened for active exploration and employment.

Primary among all of the things which we tried to accomplish at the presession were the following four basic objectives. These objectives sought for the participants were as follows:

(1) To learn about list processing languages, and to master actual programming techniques, which are especially suited for natural language programming.
(2) To learn strategies of heuristic programming, psychological simulation, sematic memory, and artificial intelligence appropriate for such analysis.
(3) To learn techniques of essay grading by computer, content analysis, and computational linguistics which may illuminate certain educational problems.
(4) To conceive, flow-chart, and partially program some suitable small strategies for possible later incorporation into larger educational researches.

The following content outline and calendar for the presession indicates in greater detail what topics were covered during the five-day workshop. Obviously, not all of these topics could be covered in great depth. However, the participants were, at least, exposed to all of these items, and frequently many informal discussions with individual staff members allowed the participants to delve much more deeply into many of these areas than was possible during the regularly scheduled sessions. The names in parentheses following each topic on the outline indicate what staff member had the major responsibility for the presentation of the materials associated with each topic. Note that we say major responsibility and not sole responsibility. All staff members were expected to, and frequently did, contribute to the presentation and discussion of materials.

One item which does not appear on this outline in any detail is the small group discussion sections which took place almost every evening of the presession. Here the participants had the opportunity to select among three or four sessions which ranged in scope from elementary deductive logic to rather technical aspects of computer programming. Also, a remote IBM QUICKTRAN terminal was available for the participants. Many took advantage of this to learn the rudiments of timesharing and to review basic FORTRAN II programming.

4

CONTENT OUTLINE AND CALENDAR FOR PRESESSION

"The Computer and Natural Language"

FRIDAY NIGHT: Arrive at Pheasant Run Lodge, St. Charles, Illinois.

Staff: Planning and Preparation
Participants: Informal social period for those present
8:00 - 11:00 P.M.

SATURDAY: Coffee: 8:30 A.M. - 9:00 A.M.

9:00 - 12:00 A.M.

I. INTRODUCTION. Background of the participants. Structure of the Seminar-Workshop. Overview of the field. (E. Page)

II. NATURAL LANGUAGE PROGRAMMING. -- All present staff.

A. Principles and conveniences:

1. Alphameric arrays (E. Page)
2. Table look-up strategies (S. Sedelow)
3. String manipulation (D. Paulus)
4. List-processing (G. Fisher)
5. Dynamic storage (G. Fisher)

1:00 - 3:00 P.M. II continued:

B. Using FORTRAN for natural-language programming

1. User-written subroutines (D. Paulus)
2. FORTRAN-imbedded conveniences such as SLIP, DYSTAL, STUFF (D. Paulus)

C. Alternative languages: LISP, SNOBOL, and especially PL/I. (G. Fisher and S. Sedelow)

[The above will be an overview. These topics will be studied also in voluntary skill sessions throughout the workshop, and developed further from time to time.]

3:30 - 5:00 P.M.

III. INTERDISCIPLINARY STRUCTURE OF THE WORK

A. Parent societies: LSA, ACM (SIGs & SICs), ADI(ASIS), AMTCL, AFIPS (FJCC, SJCC), IFIPS, LSA, MLA, APA, AERA (W. Sedelow)

B. Periodicals and publications (W. Sedelow)

C. Major centers and projects (W. Sedelow)

5:00 P.M.

Reception, dinner

8:00 P.M. Voluntary workshops or interest groups: FORTRAN, PL/I, special problems as determined by interest of participants and staff.

SUNDAY:

A.M. Free except for special interest and skill sessions:

1. PL/I programming (G. Fisher)
2. Symbolic logic: Propositional and predicate calculus (E. Page)
3. Bookshelf open (true during most free periods)

1:00 - 4:00 P.M.

IV. APPLICATIONS TO HUMANITIES (W. and S. Sedelow)

A. Categories of measurement
B. Indexes, glossaries, bibliographies, information retrieval
C. Stylistic analysis
D. Comparisons and trends: authors, periods
E. Steps toward criticism
F. Status of the field: current work and findings, relevance for education

4:00 - 5:30 P.M. Special interest seminars and groups

Evening: Special interest seminars and groups

Work on the computer terminals, etc.
Bookshelf open

MONDAY:

8:30 - 12:00 A.M.

V. LANGUAGE ANALYSIS

A. Content analysis, such as General Inquirer (D. Paulus)
B. Essay grading, such as PEG (E. Page and D. Paulus)
C. Probabilistic vs. Deterministic strategies (E. Page)
D. Parsing for syntax and for meaning (E. Page)
E. Discourse and anaphoric analysis (E. Page)
F. Information retrieval strategies (C. Helm)

1:00 - 4:00 P.M.

VI. SIMULATION OF VERBAL BEHAVIOR (C. Helm)

A. Verbal learning, such as EPAM, WEPAM, etc.
B. Semantic memory, such as Raphael and Quillian
C. Decision-making
D. Measurement problems and scientific strategies
E. Structure of simulation languages
F. Formulating languages and data structures from problem specification

4:00 - 5:30 P.M. and Evening: Voluntary workshops or interest groups.

Beginning own construction of proposed research in natural language analysis
Working with computer terminals
Reading, etc.

TUESDAY:

8:30 - 12:00 A.M.

VII. ARTIFICIAL INTELLIGENCE

A. Search (E. Page)
B. Pattern recognition, and relevance to NLA (E. Page)
C. Learning systems and the improvement of analysis (E. Page)
D. Problem-solving and planning (E. Page)
E. Statistical strategies in pattern classification (C. Helm)
F. Induction and models for future analysis (C. Helm)

1:00 - 4:00 P.M.

VIII. SOME EDUCATIONAL APPLICATIONS (A. Ellis)

A. Turing machines and computers
B. Interaction in instruction and guidance
C. Educational languages, such as TRAC, ELIZA, etc.
D. Use of information retrieval in guidance: ISVD, etc.

4:00 - 5:30 P.M.

Small groups and individual problems
Work with the computer terminals

Evening

More small group and individual work. Terminal and reading, etc.

WEDNESDAY:

8:30 - 12:00 A.M.

IX. FURTHER STRATEGIES IN NATURAL LANGUAGE ANALYSIS (Staff)

A. Ready-to-use systems and subroutines
B. Ready-to-use data sets and documents
C. Automatic dictionaries and encyclopedias
D. Cooperation among researchers
E. Additional topics

1:00 - 2:30 P.M.

X. SUMMARY AND EVALUATION OF THE PRESESSION (E. Page and D. Paulus)

2:30 - 3:30 P.M.

Final social hour and leave-taking

4:00 P.M. Chartered bus leaves for Conrad-Hilton Hotel, Chicago.
(To arrive by around 5:00 P.M.)
Others leave for Airport.

STAFF

As previously indicated, the staff of the presession consisted of nine members. Each staff member was selected because of his or her special expertise in the area or topic which they were to present. Not every staff member remained at the presession for the entire five days of the meeting. In the following list of staff the number in parentheses indicated the amount of time spent at the presession.

(1) Ellis B. Page, the director of the presession (5 days)
Bureau of Educational Research
University of Connecticut
Storrs, Connecticut
(2) Dieter H. Paulus, the assistant director of the presession (5 days)
Bureau of Educational Research
University of Connecticut
Storrs, Connecticut
(3) Allan B. Ellis (3 days)
New England Educational Data Systems
Harvard University
Cambridge, Massachusetts
(4) Carl Helm (3 days)
City University of New York
New York, New York
(5) Sally Y. Sedelow (3 days)
Department of Information Science
University of North Carolina
Chapel Hill, North Carolina
(6) Walter Sedelow (3 days)
Dean of School of Library Science
University of North Carolina
Chapel Hill, North Carolina
(7) Gerald A. Fisher, Jr. (5 days)
Bureau of Educational Research
University of Connecticut
Storrs, Connecticut
(8) John McManus, assistant to the presession staff (5 days)
Bureau of Educational Research
University of Connecticut
Storrs, Connecticut
(9) Louise Patros, secretary to the presession staff (5 days)
Bureau of Educational Research
University of Connecticut
Storrs, Connecticut

STUDY AND REFERENCE MATERIALS

The staff of the presession set up a library of 81 volumes and periodicals relating to natural language computing. These materials were available to all participants during most of the presession, and they were allowed to check these materials out overnight.

In addition to these materials, each staff member brought with him a selection of materials to supplement his lectures. These materials served either as explanatory and more detailed materials, or as outlines for the content of particular lectures. The names in parentheses indicate the staff member who distributed the materials.

A list of all materials received by each applicant follows:

A. Instructional Materials

1. Harvard Graduate School of Education -- Annual Report 1966-67. (A. Ellis) P. 101 Progress report of the Information System for Vocational Decisions.
2. MLA Conference 16. "The Application of Computing Devices to Scholarships in the Fields of Language and Literature". (S. Sedelow) P. 9. Report of MLA Conference 16 (1965).
3. Ellis -- Bibliography. (A. Ellis) P. 9 A list of 130 Bibliographic items relating to natural language computing.
4. Biographical Data on Participants of AERA Presession 7. (D.H. Paulus) P. 3 Seven tables presenting summary information on participants.
5. Exercise II-A-3. Complete the Following Program. (D.H. Paulus) P. 1 Sample program and assignment of string manipulation program written in FORTRAN IV.
6. Sedelow and Sedelow. A Preface to Computational Stylistics. (S. and W. Sedelow) P. 14. Discussion of stylistic analysis.
7. Ellis and Wetherell. The Computer and Career Decisions. (A. Ellis) P. 30. Discusses an information retrieval system for career choices.
8. McManus. Computer Evaluation of Teachers' Reports. The Lesley-Ellis Project. (McManus) P. 6. A description of the application of the General Inquirer to teachers' reports on students.
9. Levien and Maron. A Computer System for Inference Execution and Data Retrieval. (E.B. Page) P. 7 This paper reports - RAND project concerned with the use of computers in the logical analysis of large collection of factual data.
10. Content Analysis - The General Inquirer. (D.H. Paulus) P. 3 Brief outline describing structure and function of the General Inquirer System.

11. Quiz on Context-Free Grammars and Parsing. (G. Fisher) P. 1 Five item quiz on context-free grammers and parsing.
12. Elevr Script. (J. McManus) P. 1 Script illustrating the ELIZA system.
13. Weizenbaum. ELIZA - A Computer Program for the Study of Natural Language Communication Between Man and Machine. (J. McManus) P. 10.
14. FI002 FAP Fap subroutine which encodes natural language words.
15. Paulus. Feedback Problems in Project Essay Grade and "Handout to Accompany". (D.H. Paulus) P. 14. Description of an interactive essay grading program.
16. Figures 1 and 2. (S. Sedelow) P. 2. Two flow charts illustrating search strategies.
17. Page. Grading Essays by Computer: Progress Report. (E.B. Page) P. 16 Results and strategies of Project Essay Grade.
18. Outline for Session on Inter-Disciplinary Structure of the Work. (W. Sedelow) P. 2 Outline for Inter-Disciplinary structure of natural language computing.
19. Rosenbaum. A Grammar Base Question-Answering Procedure. (E.B. Page) P. 6 A description of a procedure for the automatic retrieval of information.
20. KWIC Handout. (D.H. Paulus) P. 2 A FORTRAN Program for phrase look-up.
21. The LISP Language. (D.H. Paulus) P. 19 A general description of the LISP language.
22. LSHFT (D.H. Paulus) Examples of programs written in MAP for packing and unpacking strings.
23. Kuno and Oettinger. I. Multiple-Path Syntactic Analyzer. (E.B. Page) P. 29 General description of Kuno's parsing program.
24. Asher. New Frontiers in Research; Applications of the Computer to Investigations in Reading. (E.B. Page) P. 14 A description of some computer applications to research on reading.
25. Fisher. A Parsing Program. (G. Fisher) P. 12 Flow-chart and PL/I procedures for a parsing program.
26. IIC. Outline for PL/I. (S. Sedelow) P. 2 Outline for PL/I.
27. Lawson. PL/I List Processing. (G. Fisher) P. 10 Detailed explanation of the list processing facilities of PL/I.
28. Griffiths and Petrick. On the Relative Efficiencies of Context-Free Grammar Recognizers. (E.B. Page) P. 12 A description of parsing recognition procedures.
29. Fisher and Hiller. The SCORTXT System: An Approach to Natural Language. (G. Fisher) P. 24 Describes a programming system for the computer analysis of text.
30. Yale Computer Center. SNOBOL. (D.H. Paulus) P. 24 A description of the SNOBOL language.
31. Page. Statistical and Linguistic Strategies in the Computer Grading of Essays. (E.B. Page) P. 13 Describes current strategies and results of Project Essay Grade.
32. Madnick. String Processing Techniques. (D.H. Paulus) P. 5. Discusses the internal organization of string processing systems.
33. STUFF. (D.H. Paulus) P. 14 Description of and directions for using the STUFF (String Utility Routines for FORTRAN IV) system.

34. Weizenbaum. Symmetric List Processor. (D.H. Paulus) P. 14 Description and rationale of the SLIP Language.
35. Syneta Script. (J. McManus) P. 3 Script illustrating the ELIZA system.
36. Keyser and Petrick. Syntactic Analysis. (E.B. Page) P. 73. A theoretical discussion of Petrick's strategies for syntactic analysis.
37. Outline for Table Look-Up Procedures. (S. Sedelow) P. 1 Outline for table look-up procedures.
38. Tentative Calendar for Presession. (E.B. Page) P. 3 Schedule for the presession.
39. The Tree Building and Searching Procedure. (S. Sedelow) P. 2 An illustrative PL/I procedure for tree building and searching.
40. Which Script Please. (J. McManus) P. 3 Sample script for the ELIZA system.

B. Evaluation Materials

1. Anticipated Research Using Natural Language. Open ended questionnaire requesting information about participants future research plans.
2. Review of Artificial Intelligence. (E.B. Page) P. 2 Nine review questions on artificial intelligence.
3. Review on Computer Grading of Essays. (E.B. Page) P. 2 Seven review questions on Project Essay Grade.
4. Quiz on Context-Free Grammars. (E.B. Page) P. 4 Four item quiz on context-free grammars.
5. Evaluation Form II-B. (D.H. Paulus) P. 1 Open-ended questionnaire administered after the second day, which solicits general criticisms and comments about the presession.
6. Instrument I-B. How Well Could I Do. (D.H. Paulus) P. 2 Thirty item self rating inventory on concepts of natural language computing.
7. Instrument I-C. (D.H. Paulus) P. 2 Thirty-item questionnaire. Semantic differential structure.
8. Quiz-List Processing. (G. Fisher) P. 1 Four item quiz on List processing.
9. Quiz on Natural Language Applications to Education. (E.B. Page) P. 1 Twenty item quiz on natural language computing applications to education.
10. PL/I Exercises. (G. Fisher) P. 2 Nineteen item quiz on PL/I.
11. Quiz on PL/I and string manipulation, Forms A and B. (G. Fisher) Twenty-five item quiz on PL/I and string processing.
12. Presessions Critique for Staff Members (For Directors, Instructors, and Assistants) (AERA) P. 2 Thirteen item evaluative questionnaire for presession staff.
13. AERA 1968 Research Training Presessions Program Participant Evaluation Form. (AERA) P. 2 Twenty-one item participant evaluation form on presession.

THE PARTICIPANTS

In this section, first, the criteria which were used in selecting the participants for the presession will be discussed. This will be followed by an alphabetical list of the names and addresses of the participants. Then some summary data about the participants will be presented.

Both the announcement and the proposal for the presession discussed the type of applicant who would be ideal for this sort of presession. It was indicated that this presession was not intended to be a first workshop in computer programming, statistics educational psychology, or liberal arts. Therefore, it was highly desirable that participants have some prior competence in all of these areas. The ideal participant, therefore, would be an educational psychologist or measurement specialist, with a fair working knowledge of FORTRAN, with some background and interest in the liberal arts, and with a demonstrated research drive. He would usually have a doctoral degree, but some may be pre-doctoral graduate students with unusual promise.

Formal requirements for admission were stated as follows: The participants should have (1) good background information and practice in measurement, statistics, and research design; (2) some training in psychology or educational psychology; (3) some active interest in liberal arts or in English or Social Science education; (4) some background in computer programming, preferably a good working knowledge of FORTRAN; and (5) high scores on tests of graduate aptitude, such as the GRE or MAT.

Clearly, it is difficult to evaluate all of the aforementioned criteria, and certainly, one applicant's conception of a "good background" might drastically differ from another's. However, the staff of the presession felt unanimously that almost all of the participants of the presession had the necessary background in order to benefit from the materials which were presented.

What follows is a list of the participants of the presession:

J. William Asher
Purdue Educ. Res. Center,
S.C.C. Building G
Purdue University
Lafayette, Indiana 47907

Hubert Austin
Office of Research
Ball State University
Muncie, Indiana

Richard D. Bloom
205 Overbrook Road
Piscataway, New Jersey

E. Gil Boyer
Research for Better Schools
121 S. Broad Street
Philadelphia, Penna. 19107

Roscoe A. Boyer
Box 393
University, Mississippi 38677

Donald Burrill
Ontario Institute for Studies in Education
102 Bloor St. West
Toronto 5, Ontario, Canada

G. Phillip Cartwright
Computer-Assisted Instruction Laboratory,
Pennsylvania State University
University Park, Penna. 16802

Manuel Cynamon
Brooklyn College
Brooklyn, New York

Edward R. Fagan
Penn State University
178 Chambers Building
University Park, Penna. 16802

Charles F. Harrington
Office of Student Affairs Research
McGuffey Hall
Ohio University
Athens, Ohio 45701

James D. Hennes
Program Evaluation Center
406 Turner Ave.,
Columbia, Missouri 65201

William M. Hunt
Florida Atlantic University
Boca Raton, Florida

Connie G. W. Meredith
Hawaii Curriculum Center
1625 Wist Place,
Honolulu, Hawaii 96821

Stan Middlestad
Department of Design,
University of Waterloo
Waterloo, Ontario, Canada

Edward W. Pepyne
Montague House,
School of Education
University of Massachusetts
Amherst, Massachusetts

Robert R. Prochnow
Inter-American Educational Center,
2525 Tower Life Building
San Antonio, Texas 78205

Samuel C. Reed
California Test Bureau
Bel Monte Research Park,
Monterey, California 93940

Jose R. Rios-Garau
Centro de Investigaciones y Dat os Educativos,
Edificio Barreras
Calle Guayama esq. Barbosa,
Hato Rey, Puerto Rico

Mitchell Schorow
Instruc. Systems Sec.,
Center for Study of Medical Educ.,
University of Illinois
Medical Center
901 S. Wolcott Street,
Chicago, Illinois 60612

Anita Simon
Research for Better Schools,
121 S. Broad Street,
20th Floor
Philadelphia, Penna. 19107

Henry B. Slotnick
284 Education
University of Illinois
Champaign, Illinois 61820

Kenneth J. Travers
1805 Lynwood Drive
Champaign, Illinois 61820

Merlin W. Wahlstrom
Ontario Institute for Studies in Education
102 Bloor Street, West
Toronto 5, Ontario, Canada

Wendell W. Weaver
College of Education
University of Georgia
Athens, Georgia 30601

E. Belvin Williams
Computer Center
Teachers College
Columbia University
New York, New York 10027

Peter F. Wolmut
Multnomah County Intermediate Education District
Portland, Oregon

Jules M. Zimmer
Montague House
School of Education
University of Massachusetts
Amherst, Massachusetts 01002

The following tables summarize some information about the 27 participants of the presession on seven variables. This information was collected prior to the presession on the standard AERA Presession Application Form.

Table 1

Age of Participants

AGE	FREQUENCY
<25	0
25-29	5
30-34	6
35-39	7
40-44	7
45-49	1
50-54	1
>54	0

Table 2

Sex of Participants

SEX	FREQUENCY
Males	25
Females	2

Table 3

Major Field of Ph.D. Work

Field	Frequency
Communications	1
Ed. Administration	2
Ed. Psychology	8
Ed. Research	1
English Education	1
Math. Education	1
Measurement	2
Psychology	2
Science Education	1
Special Education	1
Student Personnel	1
Not Reported or No Ph.D.	6

Table 4

Percentages of Time Spent by Participants on Research and Teaching

Percentage	Frequency Research	Frequency Teaching
0-20	3	12
21-40	7	4
41-60	6	3
61-80	3	4
81-100	6	1
Unknown	2	3

Table 5

Memberships in Professional Organizations of Participants (Other than AERA)

Organization	Frequency
APA	9
NCME	5
Psychometric Society	4
AEDS, ASA, PDK	3
ACM, NCTM, AMA, AAAS, NEA	2
AASA, NSTA, AAHP, DPMA, SPA, SEPA, IRA, CEC, NSSE, AAMC	1

Table 6

Number of Funded Research Projects Directed or Co-Directed by Participants

Number	Frequency
0	10
1	11
2	3
3	2
4	0
5	0
6	0
7	0
8	0
9	1

Table 7

Approximate Numbers of Courses Taken by Participants in Relevant Areas

No. of	Subject Areas									
Courses	Anthro.	Curr.	Adm.	Meas.	Computers	Linguistics	Math.	Psy.	Socio.	Stat
0-1	19	10	16	5	12	24	4	1	11	1
2-3	7	12	7	10	12	3	3	3	6	13
4-5	1	3	2	8	3		5	6	5	8
6-7		1	1	3			4		3	2
8-9				1			2	4		2
More than 10		1	2				9	13	2	1

EVALUATION OF THE PRESESSION

As one can readily see from the list of materials which appeared in the previous section, many evaluative devices were distributed to the participants. These devices were designed to serve two relatively distinct purposes. First, the many content mastery tests, designed, administered and scored by the various staff members, served to provide feedback to the staff members about the quality of their instruction. These instruments were generally administered immediately following each lecture. In many cases the correct responses to each item were also distributed, so as to provide feedback to the participants.

Another class of instruments was designed to evaluate the presession as a whole. Some of these devices were administered on the first day of the presession as "pre-test" instruments. Others, including open-ended questionnaires, were administered and scored after the second complete day of the presessions. This was done so that the presession organization and/or procedures could be changed if needed. Finally, instruments were administered at the close of the presession. These were post-tests, corresponding, in some cases, to the pre-tests given earlier.

Of all these instruments, five are presented and discussed in this section.

The first, labeled "Instrument I-C" asked the participants to rate each of 30 terms and concepts associated with natural language computing on each of five scales. The scales, dealing with the usefulness, complexity, practicality, and popularity of the concept, yield a fair estimate of the subjects conception of the concept. This instrument was administered at the beginning and at the end of the presession so that changes in the participants could be determined. The results, reported on the scales, indicate that the participants perception of these concepts had almost universally improved during the course of the five-day meeting.

The second instrument, labeled "Instrument II-B" was also administered twice during the presession. The first administration, after the second day of the meeting, provided information about the general satisfaction of the participants with the way in which the presession was conducted. The second administration, at the end of the presession, yielded similar information for the entire meeting. As can be seen by the results reported on the instruments, the participants were quite happy with the way the meeting was conducted. The results of the second administration indicate that this general satisfaction increased throughout the meeting.

The third instrument, labeled "Instrument I-B" asked the participants to rate their abilities to perform each of 30 tasks; all related to natural language computing. This instrument was also administered twice, once at the beginning and once at the end of the presession. The differences in the mean ratings given each item indicate that in general the participants perceived an increase in their abilities to perform these various tasks. There are two exceptions to this. First, if most participants felt that they could perform a task quite easily at the onset of the presession, there was, of course, no change in responses. Second, the items on which subjects showed little change are those that contain content that was not explicitly discussed during the presession.

The fourth and fifth instruments, named "Participant Evaluation Form": and "Presession Critique for Staff Members" are standard AERA instruments and were administered only once, at the close of the presession. The tabulation of responses on the fourth instrument, again indicates a general satisfaction with the presession. The few responses indicating dissatisfaction generally refer to one or two specific sessions which could have been improved. The fifth instrument, the staff evaluation form, shows similar results.

In summary, the results obtained by all of these instruments indicate a general professional growth on the part of both the participants and the staff, as well as a general satisfaction with the presession.

Instrument I-C

Below you will find a series of words and phrases, each representing a concept, procedure, or language. Immediately below are five scales. For each word please write that value for each scale which most closely reflects your feeling about the concept, procedure, or language. Write these values on the lines immediately following each word so that the first value indicates your choice on the first scale, the second value your choice on the second scale, etc.

Scale 1 1..........2..........3..........4..........5
Useful Useless

Scale 2 1..........2..........3..........4..........5
Simple Complicated

Scale 3 1..........2..........3..........4..........5
Practical Theoretical

Scale 4 1..........2..........3..........4..........5
Well known Little known

Scale 5 1..........2..........3..........4..........5
Interesting Dull

1. Binary search

(8)	1.8	2.1	1.8	3.0	2.9
(1)	1.1	2.0	1.2	2.0	2.0

2. PL/I

(3)	1.4	3.1	1.9	3.7	2.0
(1)	1.1	2.9	1.2	2.8	1.3

3. Symbolic logic

(2)	1.8	3.5	2.7	2.7	1.9
(1)	1.6	3.5	2.3	3.2	2.0

4. Computer parsing

(12)	1.8	4.6	3.2	4.2	2.6
(2)	1.7	3.8	2.3	3.3	1.9

5. Content analysis

(5)	1.3	3.5	1.8	2.8	1.7
(1)	1.2	3.4	1.7	2.4	1.3

6. Pattern recognition

(4)	1.6	3.6	2.6	3.3	1.8
(0)	1.6	4.1	2.5	3.3	1.6

7. Alphameric arrays

(7)	1.3	1.8	1.4	2.6	2.8
(1)	1.0	1.6	1.1	1.7	2.7

8. List processing

(8)	1.3	2.8	1.8	2.9	2.5
(0)	1.1	3.0	1.7	2.6	1.6

9. Predicate calculus

(18)	3.3	4.0	4.5	4.5	2.6
(1)	1.6	3.8	2.4	3.6	2.1

10. Information retrieval

(2)	1.0	3.7	1.6	2.3	1.8
(1)	1.1	3.6	1.5	2.4	1.6

11. Artificial intelligence

(2)	1.9	4.4	3.5	3.8	1.4
(1)	2.2	4.3	3.5	3.5	1.5

12. LISP

(14)	2.2	3.2	2.2	4.0	3.4
(2)	1.7	3.2	1.9	3.1	2.1

13. Automata theory

(17)	2.0	4.1	4.2	4.2	1.9
(2)	2.2	3.3	3.4	3.8	1.7

14. Recursive functions

(14)	1.9	2.9	2.4	3.5	2.5
(3)	1.6	3.1	2.3	3.3	2.0

15. Dynamic storage

(14)	1.3	3.5	1.7	3.8	2.2
(3)	1.2	2.9	1.3	3.2	2.0

16. Nash coding

(22)	3.7	3.7	3.3	4.6	3.3
(3)	1.8	2.8	2.0	3.2	2.1

17. Contingency analysis

(18)	1.6	3.0	2.6	3.5	2.7
(7)	1.6	2.8	1.9	3.3	2.2

18. Algeriths

(4)	1.2	2.1	1.8	1.9	1.9
(2)	1.0	2.3	1.3	1.7	1.2

19. Truth-table

(12)	1.8	2.1	2.3	2.7	2.1
(2)	1.6	2.7	2.4	2.9	1.7

20. Turing machine

(14)	2.6	2.8	4.1	3.1	1.9
(2)	2.3	2.0	3.1	3.0	1.5

21. General Inquirer

(10)	1.4	3.3	1.9	2.7	1.7
(2)	1.5	3.1	1.7	2.4	1.4

22. PEG

(17)	1.6	3.7	2.2	3.3	1.6
(3)	1.5	3.0	1.8	2.8	1.2

23. Heuristics

(11)	1.1	3.6	2.0	3.0	1.6
(5)	1.2	3.2	2.1	3.3	1.3

24. Polish notation

(22)	3.0	2.5	3.2	4.5	3.5
(6)	1.9	2.1	2.3	3.5	2.0

25. Context-free grammar

(19)	1.7	4.0	2.0	4.0	1.8
(3)	2.1	2.9	2.5	3.3	1.5

26. PROTRAN

(22)	1.[illegible]	3.3	1.5	4.1	2.3
(5)	2.3	3.0	2.2	3.8	2.0

27. Push-down store

(19)	2.2	3.5	2.3	4.1	2.8
(6)	1.8	2.4	2.0	3.0	2.4

28. MAPTEXT

(22)	2.0	4.0	2.7	4.7	3.3
(12)	1.9	2.6	2.4	4.1	2.3

29. SCORTEXT

(22)	3.0	4.3	3.3	4.7	3.7
(6)	1.5	2.9	1.8	4.0	1.7

30. SNOBOL

(14)	1.5	3.3	2.3	4.0	3.3
(5)	2.1	2.8	2.0	3.5	2.5

Note: Numbers above each line are pre-test scores. Numbers below are corresponding post-test scores. Numbers in () indicate number of participants who did not respond to the item.

Instrument I-B

HOW WELL COULD I DO ....

This instrument is designed to determine how well you could perform a series of tasks, according to your perceptions of your abilities. Would you please read each of the following tasks and rate your abilities to handle them on a 1-5 scale as follows:

(1) I could easily do this.
(2) I would have some difficulty in doing this.
(3) I would have a great deal of difficulty doing this, but could probably get it done.
(4) I could probably not do this.
(5) It would be hopeless for me even to attempt to do this task.

(PLEASE MARK ALL YOUR ANSWERS ON THE SEPARATE ANSWER SHEET.)

1.8 1. Write a FORTRAN II program that calculates means and
1.8 standard deviations.

2.0 2. Write a FORTRAN IV program that does the above.
1.8

3.9
2.7 3. Write a PL/I program that does the above.

2.2 4. Write a FORTRAN IV program that determines whether or not
2.0 a number is contained in a given list of numbers.

2.8 5. Write a FORTRAN IV program that does (4) for natural language
2.1 words rather than for numbers.

4.0
2.9.9 6. Write a PL/I program that will do (5).

3.3 7. Obtain a relatively complete list of biographical items that
2.0 deal with computer programs that play chess.

3.5
2.1 8. Write a FORTRAN II on IV program that performs a binary search.

2.8 9. Write a FORTRAN II or IV program that places a vector of
2.1 numbers in numerical sequence.

2.6 10. Write a FORTRAN II or IV program that arranges a list of words
2.2 in alphabetical order.

2.9 11. Identify 5 professional organizations whose journals are
1.4 relevant to natural language computing.

3.9 12. Write a brief paper which discusses recent progress (say
5 within the last 5 years) in computer parsing.

4.1 13. Complete a truth-table for a fairly complex statement in the
2.3 propositional calculus.

[illegible] [illegible] 14. Discuss, in some detail, what some of the major problems in pattern recognition are.

3.7 1.9 15. State under what conditions the statement -(pv(qAr)) is true.

4.5 3.0 16. Explain how SNOBOL differs from LISP.

1.8 1.2 17. Explain what an algorithm is.

3.1 1.7 18. Show under what types of circumstances a list processing language is to be greatly preferred over other languages.

2.4 1.5 19. Locate a running cononical correlation program.

3.2 2.8 20. Compare the relative speed of PL/I and FORTRAN IV programs.

2.3 2.2 21. Explain the difference between probabilistic and deterministic strategies in computing.

4.1 3.5 22. Show why a question can not be considered a statement in the prepositional calculus.

3.5 3.2 23. Evaluate the relative merits of various time sharing systems.

3.2 2.3 24. Write the necessary FORTRAN IV statement(s) to branch to statement 100 when the following expression is true -(pv(qAr)).

3.8 2.4 25. Discuss the efficiencies of various list look-up strategies.

Name at least three leading researchers working in the following areas:

4.2 2.5 26. Stylistic analysis

3.4 2.5 27. Content analysis

3.7 2.8 28. Information retrieval

3.7 2.7 29. Verbal learning and the computer

4.3 3.4 30. Theory of algorithms

Note: The first value preceding each item is the pre-test mean. The second value is the post-test mean.

Instrument II-B

Key: SA (Strongly Agree), A (Agree), ? (Undecided), D (Disagree), SD (Strongly Disagree), NA (No Answer). Please circle your choices.

	SA	A	?	D	SD	NA	SA	A	?	D	SD	NA
1. The objectives of this program were clear to me	10	8	1	3	2		12	10	1	1		
2. The objectives of this program were not realistic		2	4	12	6				4	10	10	
3. The participants accepted the purposes of this program	5	13	6				8	15	1			
4. The objectives of this program were not the same as my objectives	1	3	5	8	7			3	4	7	10	
5. I have not learned much new		2		7	15		1			3	20	
6. The material presented seemed valuable to me	13	10	1				19	4	1			
7. I could have learned as much by reading a book		2	2	10	10			1		9	14	
8. Possible solutions to my problems are not being considered	1	3	6	8	4	2		1	3	13	6	1
9. The information presented was too elementary		1	1	11	11				1	10	13	
10. The speakers really knew their subjects	18	6					19	5				
11. I was stimulated to think about the topics presented	14	9		1			20	4				
12. We worked together well as a group	4	9	8	2	1		8	13	2			1
13. The group discussions were excellent	1	4	14	4		1	8	7	7	1		1
14. There was little time for informal conversation	1	3	2	14	3	1		2	2	14	6	
15. I had no opportunity to express my ideas		2	2	14	5	1			1	10	13	
16. I really felt a part of this group	3	15	3		2	1	6	17	1			
17. My time was well spent	10	12	2				17	7				
18. The program met my expectations	10	10	2		2		10	11	2	1		
19. Too much time was devoted to trivial matters	1	2	4	10	6	1		1	1	14	8	
20. The information presented was too advanced		4	3	14	3		1	1		17	5	

Formative Evaluation Questionnaire (Continued)

	SA	A	?	D	SD	NA	SA	A	?	D	SD	NA
21. The content was not readily applicable to much research in education		2	4	5	13		2			10	12	
22. The Assistant was very helpful	5	6	12			1	11	8	3		1	1
23. Theory was not related to practice	3	4	5	7	3	2		2	2	9	10	1
24. The schedule should have been more flexible	2		4	11	6	1		4	3	10	7	

PRESESSION CRITIQUE FOR STAFF MEMBERS

Indicate your observation and judgment by checking each item in one column at the left. Items not applicable or not subject to your observation should be omitted. Be frank.

Commendable	Satisfactory	Unsatisfactory	
			1. Environmental conditions
4	2	0	a. Classroom spaces
4	2	0	b. Work spaces
3	3	0	c. Living quarters
1	5	0	d. Teaching equipment, aids (chalk boards, public address system, etc.)
3	3	0	e. Resource material, library
3	3	0	f. Eating facilities
			2. Participants
2	3	0	a. Appropriateness of academic backgrounds
2	2	0	b. Sufficiency of research experience
6	0	0	c. Willingness to work
6	0	0	d. Intellectual curiosity
6	0	0	e. Concern for applicability of techniques
4	0	0	f. Aspiration
3	2	0	g. Immediate preparation for Presession
			3. Organization
3	2	1	a. Adequacy of notice to prospective applicants
3	3	0	b. Sufficiency of preplanning
4	2	0	c. Smoothness of operation
3	3	0	d. Adaptability to obstacles and feedback
4	2	0	e. Sensitivity to grievances
2	3	1	f. Adequacy of financial support
			4. Schedule
0	6	0	a. Appropriateness of five days for the job
2	4	0	b. Time spent efficiently
3	2	0	c. Events sequenced appropriately
1	5	0	d. Punctuality
3	3	0	e. Balance between formal, informal affairs
2	3	1	f. Quantity of discussions
4	2	0	g. Quality of discussions
1	4	0	h. Quality of formal presentations
1	4	0	i. Unobtrusiveness of evaluation efforts
3	3	0	j. Methods of evaluation
			5. Outcomes
4	2	0	a. Intended content was actually taught
4	1	0	b. Increase in participant understanding
4	1	0	c. Improvement in attitude toward research
3	3	0	d. Personal associations initiated

(Over)

6. In general was the Presession well organized?

   (5) Yes (1) No Answer

7. Were the facilities suitable for the activities which you had planned? If not, specify.

   (5) Yes (1) No Answer (2) Too Expensive

8. Should Presessions be limited to the same hotel, or the same city, in which the annual meetings will be held?

   (2) Yes (1) No (1) Probably Yes (2) No Answer

9. Were you to do the same assignment over, in what major ways, if any, would you change your contribution?

   (1) Greater depth (2) No (1) Adhere more closely to schedule (2) No Answer

10. Do you wish that the Director had made firmer arrangements to assure participants and you of the staff opportunity to meet in pairs or small groups?

   (4) No (2) No answer

11. Were the objectives you set for yourself during the Presession attained?

   (5) Yes (1) No answer

12. Are you inclined to urge your colleagues to become staff members for such an institute or Presession?

   (5) Yes (1) No answer

13. In what ways, if any, did you as a staff member benefit personally as a result of your participation in this Presession?

    1. Meeting new people who are interested in the area.
    2. Own growth in professional competence.
    3. Learned from other staff members.

PARTICIPANT EVALUATION FORM

Directions: Please respond with a word, a phrase, or one or more sentences to as many of the following questions as you can. Your frank and honest evaluation can only benefit everyone concerned. Do not identify yourself by name unless you prefer to do so.

Environment and Facilities

1. a. To what extent did the relative availability or unavailability of books and journals interfere with or promote your attempts to master the content of this session?

   90% - not at all 5% - a little 5% - the library helped greatly

   b. To what extent did reproduced materials given to you by the staff improve matters?

   90% - a lot; greatly; etc. 10% - helped greatly, but insufficient time to study these materials

2. a. Did you feel that you lacked a "place to work," either alone or in small groups?

   97% - No 3% - "sort of half"

   b. Was your room satisfactory?

   94% - Yes 6% - no ventilation, too expensive

3. a. Which features of the meeting rooms were inadequate or not conducive to learning?

   90% - none 10% - seats, noise, blackboards, coffee

   b. Which features were especially facilitative in the same regard?

   carpeting, tables, water, quiet, the "happy hour" suite, comfort, nothing

Scheduling and Organization

4. a. Was five days too long a period to leave your work at home for the purpose of attending this session?

   94% - no 6% - yes

   b. Was five days too short a period in which to learn much of the content of this session?

   50% - no 50% - yes

5. a. Were you allowed enough time in which to pursue activities of your own choosing?

   85% - yes 15% - no

   b. Would you have preferred not to meet in the evening after dinner?

   94% - no 6% - yes

   c. Would you have preferred more or fewer meetings per day than there actually were? Or was the number of meetings per day agreeable to you?

   94% - agreeable 6% - a little tight

6. a. Were the individual lectures too long to sit and listen or take notes?

   60% - no 40% - some

   b. Were the lectures scheduled in an appropriate sequence?

   97% - yes 3% - "didn't notice"

7. Did you have sufficient opportunities to interact with other participants?

   97% - yes 3% - barely

8. a. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention that you desired?

   100% - no

   b. Was it helpful to have graduate student assistants present?

   97% - yes 3% - "undecided"

9. Did the attempts to evaluate your progress and reactions during the session (and at this moment) interfere with your work here?

90% - no   3% - a little   3% - found them irritating   3% found them distracting

10. In general, was the Presession well organized?

100% - yes

Content and Presentation

11. a. Did the content of the lectures and readings presuppose far more previous training than you had?

70% - no   20% - occasionally   10% - yes

b. Should less training in these areas or more have been presupposed?

70% - neither   20% - more training   10% - can't say

12. To what extent was the content of the lectures and readings relevant to what you hoped to accomplish during the session?

75% - greatly   15% - adequately   10% - no answer

13. a. Were the lecturers stimulating and interesting?

Yes, or generally - 100%

b. Were the lecturers competent to speak on the subject assigned them?

Yes, or generally - 100%

c. Were the lecturers well prepared?

Yes, or generally - 100%

14. Were you disappointed in any way with the group of participants?

97% - no   3% - a little

Answer each of the following only by checking the more appropriate blank:

15. If you had it to do over again would you apply for this Presession which you have just completed? Yes 100% No____

16. If a presession such as this is held again would you recommend to others like you that they attend? Yes 100% No____

17. Do you anticipate maintaining some sort of contact with at least one of the Presession staff? Yes 94% No 6%

18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one? Yes 100% No____ (many indicated strong agreement)

19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment? Yes____ No 94% - 6%N.

20. Is it likely that you will collaborate in research with someone else attending this Presession (other than those you already were likely to collaborate with)? Yes 40% No 60%

21. Do you feel that the staff should feel that it has accomplished its objectives during this five-day presession? Yes 97% No____

3% - "what were the objectives??"

GENERAL COMMENTS BY THE DIRECTOR OF PRESESSION

What struck me from the beginning was the irregular and voluntaristic nature of our presession. The others planned by AERA this year, and supported by the USOE, seemed to have an identifiable professional clientele ready-made for them, with extensive professional training already gained. This is true of the various statistical groups, ones concerned with college student personnel and similar substantive fields. And the payoff for such work is already well established: The statistical rules are the rules of grantsmanship; experimental design is in constant demand; personnel research positions abound, etc.

In contrast, our presession dealt with an esoteric, almost non-esistent interface of disciplines, and with a kind of research which (at least in education) must have a glorious future, but almost no present or past at all. Nevertheless, there is a way to present the work publicly so that workers will identify with it. But through a mixup (and my being in Europe during a critical time), the regular announcement did not make this kind of identification. Rather, there was a quite forbidding announcement, mentioning "computational linguistics," "parsing," and various other recondite terms which are almost guaranteed to frighten off all but a particular, unafraid sort of participant.

Thus we found our participants to be an unusual group of people: unusually qualified in mathematics; not afraid of formalisms and abstractions; generally eager to learn new things they have hardly even heard of before; tolerant of occasional obscurity, and of our inevitiable difficulties in teaching certain things which we may never have studied formally ourselves, and which we might be teaching for the first time.

The participants were also convivial, and the majority of them (though notall) early established and maintained, both with the staff and with each other, an easy first-name friendliness which, hopefully, helped to create something of a subculture in natural language processing for education. This belief is supported by their ratings and by the fine letters we have received since the end of the presession. We enjoyed it, and learned to like and respect each other, along with the emerging discipline which brought us together. While the days were often spent in learning technique, the evenings (after the sessions in enrichment or background areas) were often spent in spirited discussion of relevant philosophy (the limits of simulation, the mind/machine paradox, the programming of semantic problems, etc.), which are probably essential to a new discipline, too. The group even discovered a very talented guitarist and folk-singer in their midst!

From my own biased viewpoint, I would agree with the apparent consensus of the participants that the presession, though highly experimental, was a distinct success, and that the topic deserves a recurring place in the future plans of the AERA. It is surely one of the freshest research fields, with both methodological and substantive importance, and it promises to retain some of its experimental glow in the rapidly changing computer world of the next few years, even though workers and projects are certain to multiply in the profession.

For the future, we can count on fast changes in relative importance of various topics. The leaders, in another year or two, could probably assume a participant familiarity with PL/I, which this year was little known, and such a headstart would permit more rapid development of actual algorithms. And the field of artificial intelligence will probably be better articulated, in its relation to educational research.

Probably more of the potential participants in educational research will already have close ties with the main stream of computer science (as represented in ACM, ASIS, etc.) than is now the case, and this movement would suggest a shift in part of the curriculum. And time-sharing terminals will be richer in software convenience than was our QUIKTRAN this year, so that natural-language macro-instructions may be given more on-line demonstration and practice.

I would like to express my profound thanks to the staff and participants who made this possible, and to AERA personnel, both central office and membership, who helped us so much, and to the IBM Corporation for the free terminal use. And to Dieter Paulus, for essential help all the way, through the editing of this report. Knowing what we know from this first experience, we could surely improve the program in some solid ways in another year. But I can't help wondering whether it could again be as enjoyable. -- E. B. P.

PRESESSION VIII

INSTRUCTIONAL PRODUCT DEVELOPMENT

Directors

Dr. W. James Popham, University of California - Los Angeles
Dr. Howard J. Sullivan, Southwest Regional Laboratory for Educational
Research & Development

INTRODUCTION AND OBJECTIVES

The past two years have brought a sharp upsurge of educator interest in the procedures associated with the systematic development of educational products that achieve pre-specified instructional objectives. A concomitant of the recent support for the development and evaluation of new instructional programs has been an increased demand for skilled product developers. Yet, due in part to the recency of the product development movement, individuals with special competence in this area are in short supply.

The overall goal of the 1968 AERA Presession, Instructional Product Research, was to develop the participants' skills in product development and research. The procedures used in planning, conducting and evaluating the presession parallel those employed in programmatic product development efforts. Initially, the specific competencies required for the conduct of successful product development and research operations were carefully analyzed by the presession staff. The instructional objectives and evaluation procedures for the presession were derived from this analysis. Instructional materials and activities designed to implement the pre-specified objectives were then either prepared by the presession staff or selected from among product-developer training materials produced at UCLA or at the Southwest Regional Laboratory for Educational Research and Development.

The analysis of important product development skills yielded a list of 12 instructional objectives. Participants who mastered these objectives were able to perform the following tasks at the conclusion of the five-day presession:

1. Identify and specify the objectives for instructional products in terms of observable learner behavior.

2. Classify instructional objectives according to a modified, four-category version of the Taxonomies of Educational Objectives.

3. Discriminate among instructional objectives which contain (a) no minimal levels of learner behavior, (b) minimal levels of behavior only for an individual learner, and (c) minimal levels of behavior for a group of learners.

4. Select and/or write suitable test items, given precise instructional objectives.

5. Correctly classify (according to a four-category scheme) different types of criterion measures which may be used to evaluate educational products.

6. Correctly classify different components of sample instructional specifications.

7. Sequence enroute behaviors according to prescribed criteria.

8. Correctly identify instances in which product development rules have been (a) followed or (b) violated when presented with a series of fictitious vignettes describing product development activities.

9. Identify in given instructional products examples of selected development principles.

10. List and briefly describe appropriate procedures in product tryout and revision.

11. Specify criteria useful in evaluating the effectiveness of product development operations.

12. Recommend appropriate research designs for hypothetical situations requiring the experimental evaluation of instructional products.

LIST OF STAFF

Co-Directors:

W. James Popham
Education Department
University of California-Los Angeles

Howard J. Sullivan
Southwest Regional Laboratory for
Educational Research and Development

Instructors:

Eva L. Baker
Southwest Regional Laboratory for
Educational Research and Development

Richard E. Schutz
Southwest Regional Laboratory for
Educational Research and Development

Assistant:

Leslie Bronstein
University of California-Los Angeles

PARTICIPANTS

An approximate total of 75 completed applications were received for the Instructional Product Research Presession. Letters of acceptance were mailed to the first 56 applicants. All subsequent applications were rejected because the only available meeting room at the presession hotel could reasonably accommodate a maximum of 50 people. Withdrawal by some accepted applicants prior to the presession and the failure of others to appear at the meetings reduced the number of actual participants to 47. A list showing the name, address, institutional affiliation and job description for each participant is presented on the following pages.

To supplement the list of participants, additional descriptive data were tabulated from the applications. These data are presented in the 8 numbered topics immediately below.

1. Average age of the 47 participants: 41
2. Sex: 35 males, 12 females
3. Number holding doctorate: 36
4. Number who have had one or more funded projects: 22
5. Average number of funded projects for all participants: 1.1
6. Number who have had one or more publications (as determined by item 14 on application form): 37
7. Average number of publications for all participants: 8.3
8. Institutional affiliation
    a. Colleges and Universities: 31
    b. Regional Laboratories: 6
    c. Public Schools: 6
    d. Business and Industry: 3
    e. National Educational Research Bureau
        (Director of Educational Research, Sweden): 1

LIST OF PARTICIPANTS

Name	Address	Affiliation	Title or Position Description
Allen, William H.	Dept. of Instructional Technolgy School of Education University of South. California Los Angeles, 90007	University of Southern California	Professor of Education
Berman, Marlene	3750 Woodward Avenue Detroit, Michigan 48235	Michigan-Ohio Regional Educational Lab.	Research & Teaching
Bernazza, Ann Marie	U-93 University of Connecticut Department of Ed. Psychology Storrs, Connecticut	University of Connecticut	Research Associate
Bingman, Richard M.	10601 Ease 65th Street Raytown, Missouri 64133	Mid-continent Regional Educational Laboratory	Educational Program Specialist
Blaney, Jack P.	Extension Department University of British Columbia Vancouver 8, B.C. Canada	University of British Columbia	Assoc. Dir. of University Extension
Broadbent, Frank W.	College of Education Drake University DesMoines, Iowa	Drake University	Assoc. Professo of Education
Carter, Heather L.	7401 New Hampshire Avenue, #907 Hyattsville, Maryland 20783	University of Maryland	Research and Teaching
Carr, Julian W.	800 Washington Avenue Minneapolis, Minnesota	Readers Digest Educational Division	
Champoux, Ellen M.	School of Home Economics University of North Carolina Greensboro, North Carolina 27412	University of North Carolina	Graduate Teaching & Advising
Dixon, James E.	Physics Department Iowa State University Ames, Iowa 50010	Iowa State University	Instructor in Physics
Dixon, W. Robert	School of Education University of Michigan Ann Arbor, Michigan 48104	University of Michigan	Professor of Educational Psychology
Erickson, Richard C.	1722 Summit Drive West Lafayette, Indiana 47906	Purdue University	Teacher undergraduate & graduates

Evans, Ross A.	Box 89 Teachers College Columbia University New York, New York 10027	Columbia University	Research on Education of Handicapped
Finder, Morris	School of Education SUNY Albany, New York 12203	SUNY-Albany	Assoc. Professo in English Education
Gezi, Kalil I.	Chico State College Chico, California 95926	Chico State College	Assoc. Professo in departments of education & sociology
Groff, Warren H.	721 Highland Avenue Jenkintown, Pa. 19046	County Office Doylestown, Pa.	Administrator of an ESEA Titl III project
Hamill, Charles O.	GPO Box 708 San Juan, Puerto Rico 00936	Puerto Rico Department of Education	Director of Office of Evaluation
Hanson, James R.	7824 Pearson Way N.E. Fridley, Minnesota 55432	3-M Company	Behavioral Scientist
Hopson, James A.	Mid-continent Regional Educational Laboratory 104 East Independence Avenue Kansas City, Missouri 64106	Mid-continent Regional Educational Laboratory	Associate Director
Kliger Samuel	MIND Inc. 18 W. Putnam Avenue Greenwich, Connecticut	MIND Inc.	Associate Director of behavioral product design
Koos, Eugenia M.	4907 Neosho Mission, Kansas 66205	McRel	Research and Evaluation Specialist
Linden, Kathryn W.	Educational Psychology, SCC-G Room 53 Purdue University Lafayette, Indiana 47907	Purdue University	Teaching & Research
Lux, John E.	5100 Leighton Avenue Lincoln, Nebraska 68504	University of Nebraska	Social Science Teacher Traini
McDaniel, Ernest D.	Purdue Educational Research Center, Bldg. G South Campus Courts Purdue University Lafayette, Indiana 47907	Purdue University	Teach Research methods
McElhinney, James H.	Ball State University Muncie, Indiana 47306	Ball State University	Teach general curriculum

Maginnis, Maria C.	20522 Parthenia Street Canoga Park, California 91306	San Fernando Valley State College	
Mehlinger, Howard D.	High School Curriculum Center in Government 1129 Atwater Avenue Bloomington, Indiana 47401	Indiana University	Director of High School Curriculum Center
Miller, Donald M.	Instructional Research Laboratory 202 State Street Madison, Wisconsin 53706	University Wisconsin	Researcher
Morse, P. Kenneth	3249 Ramsgate Road Augusta, Georgia 30904	Medical College of Georgia	Educational Advisor
Myers, Ruth L.	144 Kylewood Place Muncie, Indiana 47304	Ball State University	Assoc. Prof. of Psychology
Obradovic, Sylvia M.	1811 Parker Street Berkeley, California 94703	Far West Reg. Lab. for Ed. Research & Dev.	Director of a NSF-sponsored project
Olsen, Maurice D.	Bureau for Physically Handicapped Children Room 870 State Education Bldg. Albany, New York 12224	N.Y. State Special Ed. Instructional Materials Center	Coordinator of a N.Y. State Network
Overing, Robert L.	Faculty of Education University of British Columbia Vancouver, R.C.	University of British Columbia	Assoc. Prof. of Educational Psychology
Pollard, William H.	132 W. Market Street Salinas, California 93901		Assistant Superintendent
Raun, Chester E.	Science Education Center Sutton Hall 227b University of Texas Austin, Texas	University of Texas	Research Coordinator
Raven, Ronald Jacob	School of Education State University of N.Y. Buffalo, New York	State University of New York	Teach Science Curriculum
Scott, Roger O.	Foreign Language Innovative Curricula Studies 550 City Center Bldg. 220 E. Huron Ann Arbor, Michigan 48108	University of Michigan	Instructional Designer
Shaffer, V. Faye	420 S. Buchanan Edwardsville, Illinois 62025	Southern Ill. University	Teaching & Research

Stern, Jacob	303 Erickson Hall Michigan State University East Lansing, Michigan 48823	Michigan State University	Research Associate
Svensson, Nils-Eric	Onskehemsgatan 43 6 tr Bandhagen, Sweden	National Board of Education	Head of Researc Planning Bureau
Toggenburger, Frank J.	Office of Research & Development Room G-280 450 N. Grand Avenue Los Angeles, California 90012	L.A. City Schools - University of S. California	Assistant Director
Torrey, Robert D.	Tamalpais Union High School Dis. Larkspur, California 94939	Tamalpais Union High School Dis.	Assistant Superintendent
Uthe, Elaine F.	115 Erickson Hall Michigan State University East Lansing, Michigan 48823	Michigan State University	Teaching & Research
White, Andrew W.	College of Santa Fe Cerrillos Road Santa Fe, New Mexico 87501	College of Santa Fe	Academic Dean of College
Wood, Wilton H.	Andrews University Andrews, Michigan 49104	Andrews University	Director of Student Teachin
Yelon, Stephen L.	457 Erickson Hall College of Education Michigan State University East Lansing, Michigan	M.S.U.	Assistant Prof. of Educational Psychology
Zion, Carol L.	Dallas County Junior College Dis. Main & Lamar Dallas, Texas	Dallas County Junior College District	Curriculum planning

INSTRUCTIONAL PROGRAM AND MATERIALS

The instructional program and materials were organized to provide direct instruction and practice on the presession objectives. Instructional sessions were scheduled daily from 9:00 a.m. until 4:30 p.m., and evening meetings with optional attendance were held from 7:00 until 9:00 p.m. on the first three nights of the presession.

The complete schedule for the presession is presented in Table 1 on the next page. The daytime program was divided into four sessions daily. Typically, direct instruction and practice were provided on the presession objectives during the first three sessions each day. During the final daytime session each participant worked individually on instructional handouts given that day, prepared his own small-scale instructional product, or consulted with presession staff members on his ongoing or planned product development and research activities.

The optional evening meetings were scheduled to provide participants with an opportunity to interact with each other and the presession staff in group discussions. Tape-filmstrip instructional programs were shown at the beginning of the first two evening meetings to stimulate the discussions. Attendance at the optional evening meetings ranged from a low of 25 individuals (53% of the 47 presession participants) at the initial session to a high of 40 participants (85%) at the final meeting.

A total of 38 separate handouts, ranging in length from one to 60 pages, comprised the materials used for instructional and evaluation purposes. A complete listing of the materials provided for all presession participants is presented in Table 2.

PRESESSION SCHEDULE

	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY
SESSION I 9:00-10:30	Organization and Pretest	Measuring Objectives (4) Criterion Measures Program (5)	Rules for Developing Instructional Products: Discussion (8)	Simplified Designs Program (12)	Posttest
SESSION II 10:45-12:00	Product Development Overview Educational Objectives Program (1)*	Instructional Specifications (6) Sequencing Enroute Behaviors (7)	Development Principles (9)	Designing Evaluative Experiments	Product Development Prospects
SESSION III 11:30- 2:45	Quality of Objectives (2) Performance Standards (3) Developing Instructional Products	Rules for Developing Instructional Products (8)	Development Principles (9) Tryout and Revision (10)	Evaluating Development Operations (11)	Posttest Results and Presession Summary
SESSION IV 3:00- 4:30	Lab: Participants work on product development project, complete instructional materials and/or consult with staff	Lab: Participants word on product development project, complete instructional materials, and/or consult with staff	Lab: Participants work on product development project, complete instructional materials, and/or consult with staff	Lab: Participants work on product development project, complete instructional materials, and/or consult with staff	
EVENING MEETINGS (optional) 7:00- 9:00	Group Discussion Filmstrip-tape program: (Improved Educational Programs)	Group Discussion Filmstrip-tape program: (Research in the Schools, Part I: Classifying Educational Research Studies)	Group Discussion		

*Numbers in parentheses show the objective for which instruction was provided during the session designated.

PRESESSION MATERIALS

1. Pre Tests: Form X, Parts I and II (20 pages & 5 pages)
2. Pre Test Correct Answer Key (1 page)
3. Profile Sheets (1 page)
4. Instructional Product Research: Introductory Hand-outs (8 pages)
5. Educational Objectives Program Answer Sheets (1 page)
6. Objective 3 Practice Sheets (1 page)
7. Product Documentation and Review Guidelines (10 pages)
8. Instructional Objectives (17 pages)
9. SWRL Technical Glossary (8 pages)
10. Establishing Performance Standards (17 pages)
11. Selecting Appropriate Educational Objectives (19 pages)
12. Product Research: A New Curriculum Specialty (5 pages)
13. Improved Educational Program Answer Sheets (1 page)
14. Improved Educational Program Criterion Tests (1 page)
15. Criterion Measures Examples (1 page)
16. Educational Criterion Measures Answer Sheets (1 page)
17. Objective 6 Practice Sheets (1 page)
18. Rules for the Development of Instructional Products (60 pages)
19. Design Specifications: Objectives and Prototype Items (21 pages)
20. Writing Instructional Specifications (15 pages)
21. Educational Criterion Measures (24 pages)
22. Write is Right (5 pages)
23. Sequencing Enroute Behaviors (25 pages)
24. Exams: Research in the Schools - Part I (4 pages)
25. Answer Sheets: Classifying Educational Research Studies (1 page)
26. Criterion Test Items: Objective 12 (1 page)
27. Appropriate Practice (17 pages)
28. Providing Knowledge of Results (17 pages)
29. Make it Interesting (14 pages)
30. Avoid Irrelevancies (13 pages)
31. Exams: Research in the Schools - Part II (6 pages)
32. Answer Sheets: Interpreting Research Results (1 page)
33. Simplified Designs for School Research (26 pages)
34. Developing the "D" in Educational Research and Development (11 pages)
35. Research, Development, and Improvement in Education (16 pages)
36. Post Tests: Form Z: Parts I and II (22 pages & 5 pages)
37. Post Test Correct Answer Keys (1 page)
38. AERA Evaluation Forms (1 page)

EVALUATION RESULTS

The primary evaluation source was the post-instructional performance of the participants on the instructional objectives of the presession. Two parallel test forms containing 190 items each were employed as direct measures of the 12 objectives. Each test form measured all 12 objectives, and each form contained the same number and type of items for any single objective from among the twelve. The pretest, Form X and Form X - Part II, was administered at the opening session on the first day of the presession. The post-test, Form Z and Form Z - Part II, was administered during the first period on the final day. A copy of Form X is included as Appendix A of this report. Form Z is available from the authors upon request.

Table 3 shows the pretest and post-test mean scores by objective and presents a group profile for each test. The table reveals that the mean pretest score for all participants on the 190-item test was 112.6 (59%) and the mean post-test score was 155.7 (82%). Performance gains by objective from pretest to post-test ranged from 8% (objective 2) to 73% (objective 12). As indicated in the table, the participants attained a group post-instructional performance level of above 80% on 9 of the 12 objectives.

The presession critique forms prepared for use at all 1968 AERA presessions and completed by the participants and staff at the conclusion of the presession served as additional sources of evaluation. The responses of all participants who completed the Participants Evaluation Form are summarized in Appendix B. Staff responses are also shown in Appendix B on the form entitled Presession Critique for Staff Members.

The summarized responses of both participants and staff members show consistently favorable evaluation of all aspects of the presession. Tabulation of positive and negative responses and comments on the Participants Evaluation Form, with items related to the hotel facility omitted, reveal a ration of 10 positive responses from participants to each negative response.

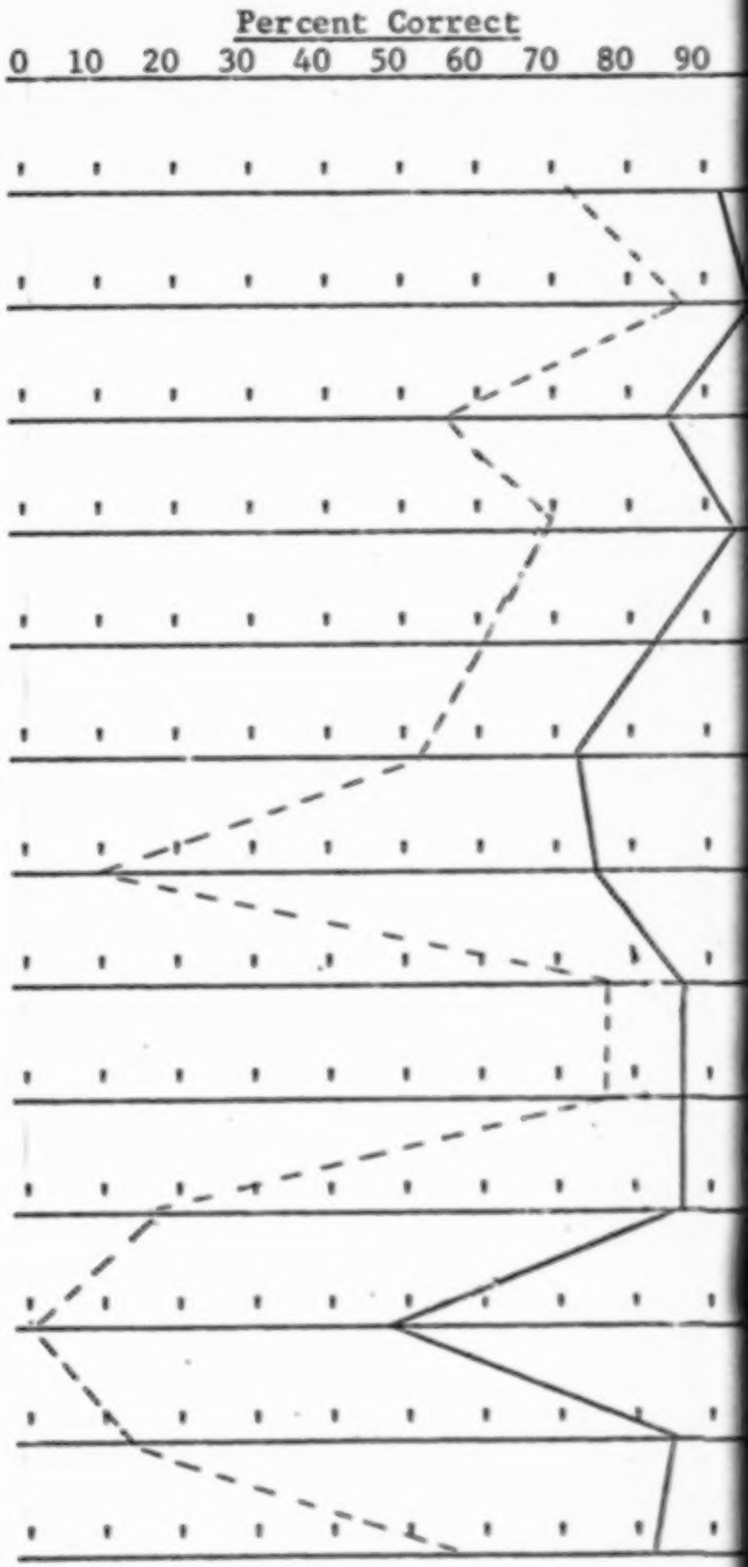
Based upon the post-instructional achievement of the participants and the written evaluations from both participants and staff members, it appears reasonable to conclude that the presession was a success.

Table 3

*GROUP PROFILE: MEAN PRETEST AND POST-TEST SCORES BY OBJECTIVE

Pretest (Form X)
Post-test (Form Z)

Obj. No.	Content	Exam Section	No. Items	No. Right Pre	No. Right Post
1	Instructional Objectives	II	10	7.2	9.1
2	Objective Domains	III	10	8.9	9.7
3	Performance Standards	IV	10	5.9	8.6
4	Prototype Test Items	VI	10	7.0	9.1
5	Criterion Measures	V	10	6.1	8.4
6	Instructional Specs	VII	10	5.3	7.1
7	Sequence Behaviors	XV	10	1.0	7.6
8	Development Process	I	50	38.6	43.0
9	Development Principles	VIII-XI	40	30.5	34.3
10	Tryout and Revision	XIII	7	1.3	6.0
11	Development Operations	XIV	18	.2	8.5
12	Research Designs	XII	5	.6	4.3
	TOTALS	all	190	112.6	155.7



*The table shows the mean number of correct answers by objective for all participants who completed each test. The broken (left-hand) profile line in the 'percent correct' column indicat pretest performance: the solid (right-hand) line shows post-test performance.

PRESESSION CRITIQUE FOR STAFF MEMBERS

Indicate your observation and judgment by checking each item in one column at the left. Items not applicable or not subject to your observation should be omitted. Be frank.

Commendable	Satisfactory	Unsatisfactory		
				1. Environmental conditions
	5			a. Classroom spaces
	5			b. Work spaces
	5			c. Living quarters
2	3			d. Teaching equipment, aids (chalk boards, public address system, etc.)
1	1	1	(2 none)	e. Resource material, library
1	4			f. Eating facilities
				2. Participants
1	4			a. Appropriateness of academic backgrounds
	5			b. Sufficiency of research experience
1	4			c. Willingness to work
1	4			d. Intellectual curiosity
4	1			e. Concern for applicability of techniques
1	4			f. Aspiration
	5			g. Immediate preparation for Presession
				3. Organization
5				a. Adequacy of notice to prospective applicants
5				b. Sufficiency of preplanning
5				c. Smoothness of operation
3	2			d. Adaptability to obstacles and feedback
1	3		(1 none)	e. Sensitivity to grievances
2	3			f. Adequacy of financial support
				4. Schedule
3	2			a. Appropriateness of five days for the job
3	2			b. Time spent efficiently
5				c. Events sequenced appropriately
4	1			d. Punctuality
4	1			e. Balance between formal, informal affairs
3	2			f. Quantity of discussions
2	3			g. Quality of discussions
4	1			h. Quality of formal presentations
1	4			i. Unobtrusiveness of evaluation efforts
4	1			j. Methods of evaluation
				5. Outcomes
5				a. Intended content was actually taught
5				b. Increase in participant understanding
2	2		(1 none)	c. Improvement in attitude toward research
2	3			d. Personal associations initiated

6. In general was the Presession well organized? yes - 5

7. Were the facilities suitable for the activities which you had planned? If not, specify.

   yes - 4 Adequate - 1

8. Should Presessions be limited to the same hotel, or the same city, in which the annual meetings will be held?

   yes - 4 Depends - 1

9. Were you to do the same assignment over, in what major ways, if any, would you change your contribution?

   None - 2
   More structured handouts - 1
   Be less directive - 1 (1 no answer)

10. Do you wish that the Director had made firmer arrangements to assure participants and you of the staff opportunity to meet in pairs or small groups? no - 5

11. Were the objectives you set for yourself during the Presession attained?

    yes - 4 (1 no answer)

12. Are you inclined to urge your colleagues to become staff members for such an institute or Presession?

    yes - 5

13. In what ways, if any, did you as a staff member benefit personally as a result of your participation in this Presession?

    Increased frustration tolerance for colleagues - 1
    Feedback on instruction - 1
    Realize necessity for justifying dogma underlying product research and development - 1
    Became acquainted with several people with similar professional interests - 1
    (1 no answer)

PARTICIPANT EVALUATION FORM

Directions: Please respond with a word, a phrase, or one or more sentences to as many of the following questions as you can. Your frank and honest evaluation can only benefit everyone concerned. Do not identify yourself by name unless you prefer to do so.

Environment and Facilities

1. a. To what extent did the [illegible]ive availability or unavailability of books and journals interfere w[illegible]romote your attempts to master the content of this session?

None - 20 None because of availability of handouts - 6

b. To what exten[illegible] reproduced materials given to you by the staff improve matters?

Very pos[illegible] 21 Positive - 7 Neutral - [illegible]

2. a. Did you feel th[illegible] a "place to work," either alone or in small groups?

No - 30 Yes - [illegible]

b. Was your room satisfactory? Yes - 25 No - 4 Neutral - 3

3. a. Which features of the meeting rooms were inadequate or not conducive to learning?

Crowded - 23 Too hot - 2 None - 2

b. Which features were especially facilitative in the same regard?

None - 5 Tables - 4

Scheduling and Organization

4. a. Was five days too long a period to leave your work at home for the purpose of attending this session?

No - 19 Yes - 8

b. Was five days too short a period in which to learn much of the content of this session? No - 28 Yes - 2

5. a. Were you allowed enough time in which to pursue activities of your own choosing?

Yes - 33 No - 1

b. Would you have preferred not to meet in the evening after dinner?

No - 23 Yes - 4 Neutral - 3

c. Would you have preferred more or fewer meetings per day than there actually were? Or was the number of meetings per day agreeable to you?

Agreeable - 29 More - 1 Fewer - 1

6. a. Were the individual lectures too long to sit and listen or take notes?

No - 29 Yes - 2 Sometimes - 2

b. Were the lectures scheduled in an appropriate sequence?

Yes - 31 No - 2

7. Did you have sufficient opportunities to interact with other participants?

Yes - 32 No - 3

8. a. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention that you desired?

No - 31 Somewhat - 4

b. Was it helpful to have graduate student assistants present?

Yes - 24 Neutral - 6

9. Did the attempts to evaluate your progress and reactions during the session (and at this moment) interfere with your work here?

   No - 29 Yes - 2

10. In general, was the Presession well organized? Yes - 28 Could be improved - 2

Content and Presentation

11. a. Did the content of the lectures and readings presuppose far more previous training than you had? No - 27 Less - 2 To some extent - 2

    b. Should less training in these areas or more have been presupposed?

    No - 21 More training - 8

12. To what extent was the content of the lectures and readings relevant to what you hoped to accomplish during the session?

    Very relevant - 19 Relevant - 4 Not relevant - 3

13. a. Were the lecturers stimulating and interesting?

    Yes - 16 Generally - 6 Varied with individuals - 5 No - 1

    b. Were the lecturers competent to speak on the subject assigned them?

    Yes - 28 Fair - 3

    c. Were the lecturers well prepared?

    Yes - 24 No - 5 Varied - 4

14. Were you disappointed in any way with the group of participants?

    No - 21 Yes - 6

Answer each of the following only by checking the more appropriate blank:

15. If you had it to do over again would you apply for this Presession which you have just completed? Yes 27 No 7

16. If a presession such as this is held again would you recommend to others like you that they attend? Yes 27 No 5

17. Do you anticipate maintaining some sort of contact with at least one of the Presession staff? Yes 23 No 6

18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one? Yes 31 No 1

19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment? Yes 4 No 27

20. Is it likely that you will collaborate in research with someone else attending this Presession (other than those you already were likely to collaborate with)? Yes 15 No 15

21. Do you feel that the staff should feel that it has accomplished its objectives during this five-day presession? Yes 29 No 2

APPENDIX A

*CRITERION TESTS

EXAMINATION: THE DEVELOPMENT OF INSTRUCTIONAL PRODUCTS

FORM X

Southwest Regional Laboratory for Educational Research and Development
11300 La Cienega Boulevard
Inglewood, California

1967

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* Form X and Form X - Part II, presented in this appendix, served as the pretest. The post-test, Form Z and Form Z - Part II, are available from the authors upon request.

Examination: The Development of Instructional Products

Form X

W. James Popham[*]

General Directions: Complete only the sub-tests below which are checked, as directed in the examination booklet. You may write on the examination booklet itself, but please make all of your responses on the answer sheet which has been provided. Be sure to write your name on the answer sheet.

___ I. THE DEVELOPMENT PROCESS
___ II. INSTRUCTIONAL OBJECTIVES
___ III. OBJECTIVE DOMAINS
___ IV. PERFORMANCE STANDARDS
___ V. CRITERION MEASURES
___ VI. PROTOTYPE TEST ITEMS
___ VII. INSTRUCTIONAL SPECIFICATIONS
___ VIII. APPROPRIATE PRACTICE
___ IX. KNOWLEDGE OF RESULTS
___ X. PROMOTING LEARNER INTEREST
___ XI. AVOIDING IRRELEVANCIES

PART I. THE DEVELOPMENT PROCESS

Part I. Directions: This part of the examination consists of five brief descriptions of segments in the product development process. Each description is followed by ten statements, some of which are correct. You are to read each description, then on the answer sheet which has been provided, mark an A for each statement which is correct. Nothing needs to be marked for a statement which is incorrect. If insufficient information has been presented for you to judge the correctness of a statement, leave the item blank.

Generally speaking, certain incidents in the development of instructional products are recounted in the fictitious descriptions. Your task is to identify correct procedures which were employed or errors which were made by the product developers. No attempt has been made to be devious in the examination. You need not "read between the lines" in order to judge the correctness of the 50 statements. The answers should be apparent to you if you are familiar with appropriate steps in the product development process. Be sure to use the answer sheet for your responses. Now commence with the first description and its accompanying ten statements.

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[*] Parts IV and VI were prepared by Eva L. Baker. Part VII was prepared by Robert J. Berger

Exercise One

It is mid-December and Frieda, a regional laboratory employee, has been given the responsibility of developing a short self-instruction program to teach sixth grade pupils how to use commas. She has received a set of five explicit instructional objectives from the individuals who originally formulated the project. Along with these objectives there are samples of a single prototype test items for each objective. Frieda has been told that the instructional product is to take no more than four hours of the average learner's time.

The first thing she does is to develop a 40-item criterion test to be used at the close of the program. She has each of the five objectives represented by at least five test items, although two objectives which she feels to be more important are represented by 10 items.

Frieda carefully considers the enroute (intermediate) behaviors which the learner must master on his way to the criterion behaviors and then sequences these from least to most difficult, ending with behaviors equivalent to those called for in the instructional objectives. She then prepares practice sequences for each of the enroute and terminal behaviors so that the learner will be able to practice using commas in a variety of situations. After having three colleagues react to her first version of the instructional product, she makes a number of revisions.

Frieda then arranges to field test the program in the public schools and secures the cooperation of a nearby elementary school. She arranges to use three classes for approximately one week and administers the program in early February. At its conclusion the 40-item criterion test is given to each of the 86 children who completed the program.

Frieda is pleased that all youngsters were able to finish the instructional product in three hours or less. She is somewhat concerned, however, that the average score on her 40-item test is only 21.2 correct. She resolves to study the post-test results as well as the responses made by pupils during the program and to make the revisions which seem dictated by the data.

* * * * * * * * * *

Which, if any, of the following statements are correct? (Mark on the answer sheet an A for any which are correct.)

1. Frieda was probably correct in providing practice behaviors for the learner which were equivelent to those called for in the instructional objectives.
2. She should have required at least two prototype test items along with the instructional objectives.
3. Each objective should have been represented equally on the criterion test.
4. Frieda field-tested her first version of the product on too many learners.
5. She should have pre-tested the subjects.
6. Her program was dull.

7. Too much time was taken to complete the first version of the product.

8. Five objectives are too many for such a program.

9. The enroute behaviors should not have been sequenced from least to most difficult.

10. More than three colleagues should have reacted to the first version of the program.

Exercise Two

A group of three beginning product developers has been assigned the general task of preparing a 50-minute self-instruction sequence for learners in the field of English. The resulting product will be used by junior high school instructors, more specifically, ninth grade English teachers, as a remedial program for students who are having difficulty with one or more topics in the subject.

After some discussion (approximately three days) among themselves and a few experienced instructional programmers, the three decide to develop a remedial program which will increase the student's ability to diagram standard sentences so that each of the eight parts of speech are clearly identified.

They then turn to the task of deciding on an appropriate criterion test, spending the next month in a series of carefully organized discussions regarding the possible methods of assessing a learner's ability to manifest mastery of the diagramming process. For example, during one meeting the three individuals develop sample items and take turns answering them, then analyzing the adequacy of each other's responses. The following objective is agreed upon for the program:

When presented with 10 previously unseen sentences, five simple (that is, one clause) and five complex (that is, two or more clauses), the learner will be able to diagram at least eight without any errors according to the procedure specified in the 50-minute instructional program. Ninety per cent (or more) of the learners who complete the program must satisfactorily achieve this level of proficiency.

The terminal behavior having been selected, the three product developers then prepare 25 test items based on the above objective and arrange to administer the 25-item test to a group of 30 ninth grade English students. Gratifyingly, the students are not able to perform well on the test, so the three developers next address themselves to a careful task analysis in order to identify necessary types of entry behaviors (the skills the pupil possesses before starting the program) and enroute behaviors (the intermediate skills the learner must achieve in order to attain the terminal behavior). Having done this, approximately four days being expended on the task, an appropriate pre-test is prepared including items which reflect desired (1) entry behaviors, (2) enroute behaviors, and (3) criterion behaviors. This test is then administered to ten pupils and, having carefully analyzed their responses, the product developers begin to prepare the first draft of their instructional product . . .

* * * * * * * * * *

Which, if any, of the following statements are correct?

11. The preparation of the criterion test quite properly preceded the development of the instructional product.

12. It was unnecessary to assess learners' ability to perform entry and enroute behaviors.

13. Too much time was spent in the determination of a suitable instructional objective.

14. The instructional objective decided on was not sufficiently precise.

15. The minimum level of proficiency expected of learners was not well specified.

16. The adequacy of the original formulation (i.e., the selection of the particular topic) was not well justified.

17. Too much time was spent by the product developers on the original selection of a topic.

18. The expanded pre-test, the one with the addition of items based on entry and enroute behaviors, should have been given to at least 30 learners.

19. The first version of the instructional sequence should have been prepared and tried out prior to the administration of the pre-test.

20. It was quite appropriate for the product developers to undertake the task analysis of entry and enroute behaviors.

Exercise Three

Fred Peabody, an experienced instructional programmer, has been assigned the responsibility of developing a self-instruction program to teach third grade youngsters how to add and subtract fractions. One of the first things he does is to go to a third grade classroom and ask permission to talk with six of the youngsters. Individually he discusses the topic of fractions with each of them and attempts to find out what the students already know that will be relevant to his task. Having completed his assessment of the data secured from these interviews, he devises the following objective for his program: "At the conclusion of the program the learner will manifest a sophisticated ability to handle addition and subtraction problems involving fractions."

After consultation with the teachers and the administrators he prepares a formulation paper in which he identifies the above objective and attempts to support the value of the proposed program. He cites the opinions of teachers who indicate that a short-term program such as that which he proposes will have considerable utility in their classes and cites evidence from published bibliographies of program material that there is currently no such short-term program available to teachers in a form which does not require the use of teaching machines. Accordingly, he proposes that his program will take approximately one and a half or two hours to complete and will be presented by printed-paper booklets. This formulation paper is presented to a number of colleagues with whom Peabody works and, having read it, they agree that his selections of topic and presentation medium are sound.

He develops a criterion test in which the learners must add and subtract pairs of fractions. He also prepares other items which assess the learners' ability to add and subtract whole numbers. He combines these to form a pretest which he administers to a sample of 25 third graders drawn from a nearby elementary school.

Having determined that the youngsters cannot perform the terminal behavior, but do possess the desired prerequisite skills, Mr. Peabody then prepares an early version of his program.

Since he employs a variety of approaches in his programming efforts, Mr. Peabody attempts to select a tactic for this particular product. After introductory remarks and a certain amount of exposition (approximately three pages' worth) he gives the student a series of ten sets of simple fractions to add. After they have concluded adding this set, he provides them with the correct answers which they can see by turning a page and comparing the proper answers with the answer sheet on which they have been instructed to make their responses. Several more sets of these addition exercises are provided in order that the learner may practice the operation of fraction addition. After each ten problems, Mr. Peabody provides knowledge of results in a manner similar to that described above.

For variety's sake, however, when it comes to subtraction of fractions, he approaches it in an entirely different fashion. He presents a series of short story (word) problems to the learner which involve the subtraction of fractional quantities. The learner is obliged to "think through" what fractional quantities are required and then form a mental subtractional operation regarding each of these particular problems. After each set of three word problems, once more knowledge of results is provided whereby the learner can check the accuracy of his responses. In all, five sets of these subtraction word problems are presented.

Mr. Peabody has multiple copies of his program prepared on a mimeograph machine and takes it to the same elementary school where he earlier secured such excellent cooperation. He administers the program at the school where he had his original interviews, using again the same students that were so helpful two weeks earlier and two other classes as well. At the conclusion of the program which, as he predicted, took approximately an hour and 45 minutes for most students to complete, he administers the series of 20 simple addition problems and 20 simple subtraction problems, each involving two fractions. On the 40-item test he is disappointed when the mean performance of the 28 pupils who complete the program pre-test is only 26.3. Mr. Peabody decides to revise his program consistent with these data. He is particularly anxious to check the responses which learners made during the program since he believes these will provide him with clues as to what sections are most in need of alteration.

* * * * * * * * * * * * *

Which, if any, of the following statements are correct?

21. Mr. Peabody wisely planned to use learner responses during the instructional program as a guide for improving his program.

22. The performance of Mr. Peabody's students on his program was acceptable and he ought to be satisfied.

23. Mr. Peabody did not define the terminal behavior adequately in his objective.

24. Too much delay may have been involved in the knowledge of results provided for the majority of the learners' responses.

25. The programmer should not be concerned with "variety" in developing his instructional materials.

26. Mr. Peabody should have involved more learners during his initial exploratory interviews.

27. He probably field tested his first version of the program with too many learners.

28. He should have field tested his program with a group of students other than those involved in his initial exploratory interviews.

29. The operations associated with his formulation procedure were inadequate.

30. Peabody had too few items on his criterion test.

Exercise Four

Mrs. Shear has acquired a reputation in the past several years of being a remarkably skilled product developer. She believes that much of her reputation is due to the fact that she has developed a workable procedure for accomplishing instructional objectives. She has discovered that the preparation of audiotape narration, coupled with the use of visual transparencies placed on an overhead projector by the teacher, efficiently accomplishes the behavior changes she desires. Furthermore, she always tests her program through the use of five alternative multiple choice examinations which she has become most adept at constructing. No matter what the objective, whether cognitive, affective, or psychomotor in nature, and no matter how complex, Mrs. Shear analyzes it in such a way that it can be handled through the use of this audio tape-transparency approach.

The first thing she always does is construct a relevant multiple choice test. She uses five choice items because of their greater efficiency in discriminating between the more and less knowledgeable learners. She is careful to try out her tests with an appropriate group of learners so that she can tell which items properly discriminate between the more and less knowledgeable learners in the group. Although sometimes her methods fall short of expectations, Mrs. Shear's reputation as a productive programmer is widely held among her colleagues.

* * * * * * * * * * * * * *

Which, if any, of the following statements are correct?

31. Mrs. Shear quite appropriately prepares her criterion test before developing the instructional materials.

32. Mrs. Shear is too inflexible regarding her selection of programming strategies.

33. Her approach is bound to fail with highly creative youngsters.

34. Few teachers would be willing to place transparencies on an overhead projector as instructed in the program.

35. There are some criterion behaviors for which multiple choice tests are inappropriate, hence, Mrs. Shear ought not to use them in all situations.

36. Mrs. Shear's tests are inappropriate because they are built on a norm referenced (comparing student to student) rather than a criterion referenced basis (comparing student performance to goals).

37. Mrs. Shear's programs are probably uninteresting.

38. She ought to achieve her objectives in every situation she attempts, probably on the first or second draft of her program, or she does not deserve the reputation she has as a skilled programmer.

39. Mrs. Shear should realize that group-paced programs have little place in the public schools.

40. Her programming approach will prove effective only in the cognitive domain.

Exercise Five

Mr. Smith has been assigned the task of developing a one-week (approximately five 50-minute periods) group-paced instructional program designed to teach high school chemistry students to treat correctly certain analytic equations and problems involving unknown chemical elements. Mr. Smith does not attend to the formulation process because this has been done by others. His responsibility is to develop the actual instructional material. The instructional objective which has been given to him by members of the formulation team is the following:

> At the conclusion of the instruction at least 80 per cent of the learners will be able to solve seven of ten equation problems involving an unknown compound.

Mr. Smith arranges to talk to several high school chemistry instructors and a half a dozen high school chemistry students to secure some ideas as to the proper tactics to employ in teaching the particular subject. The students are asked how much they already know of the topic so that Mr. Smith can identify the competencies he can build upon when preparing the instructional sequence.

He develops four programs, each lasting approximately 40 minutes, with the expectation that these early versions will be revised and augmented. He adopts a "lean" strategy in programming in which he offers the minimum amount of instructional materials that he believes is requisite, anticipating that if the program fails it will be easier to add to it than to subtract superfluous material from an effective program sequence. All of the programmed material is transferred to an audiotape so that it can be coordinated with visual materials which are presented on 2 x 2 slides. He ultimately plans to transfer the visual sections to a filmstrip, but believes the slide presentation will offer more flexibility for the subsequent addition or deletion of modified visuals.

He next develops a criterion test consisting of thirty items in which the student is presented with verbal descriptions of chemical interactions and asked to describe with chemical equations the nature of the quantitative equations which have been verbally described.

He tries the program with four learners who answer, respectively, 21, 25, 26, and 27 items correctly on the 30-item test.

* * * * * * * * * * * * * * * * *

Which, if any, of the following statements are correct?

41. Mr. Smith's expectation that the early version of the program will be revised is realistic.

42. His students did not perform as well as they should have on his first draft materials.

43. A "lean" programming strategy has been demonstrated to be ineffectual in this type of task.

44. Mr. Smith should have prepared his criterion test prior to the development of his first version instructional product.

45. Mr. Smith's instructional materials were probably dull.

46. The use of audiotape and filmstrip is inconsistent with the notion of group-paced programs.

47. Mr. Smith's criterion test was not appropriate for the instructional objectives he had been given.

48. Mr. Smith, or any programmer, has the clear responsibility for evaluating the adequacy of the formulation operation no matter at what point he is introduced to the development process.

49. Mr. Smith should not have consulted teachers and pupils prior to the development of his first draft of instructional materials.

50. Mr. Smith should have developed first draft materials which were exactly as long as those meant for the program.

PART II. INSTRUCTIONAL OBJECTIVES

Part II Directions: In the following list identify any properly stated instructional objectives by marking an *A* on the answer sheet. Nothing need be marked for improperly stated objectives.

51. The student will grasp the significance of the Treaty of Versailles.
52. The student will have an attitude favorable to English grammar indicated by his response to a questionnaire.
53. The student will know six verbs.
54. The student will learn the names of the common tools in wood shop.
55. The teacher will list three major causes of the Civil War on the chalkboard.
56. The student will know the important battles in World War I.
57. The student will prefer cooking to sewing.
58. The student will be able to correctly thread a sewing machine.
59. The student will pay attention as the teacher demonstrates the use of the lathe.
60. The student will be able to develop a sense of the cultural unity of man.

PART III. OBJECTIVE DOMAINS

Part III Directions: Classify each objective below by marking the correct letter according to the following scheme:

A. psychomotor
B. affective
C. cognitive--higher than lowest level
D. cognitive--lowest level

The learner:

61. is able to choose the best of two solutions to a geometry problem using standards given by the teacher.
62. exhibits tolerance for others by displaying good manners toward those of minority groups.
63. lists the names and contributions of five key curriculum workers.
64. properly knits a baby blanket.
65. scores well on the *Minnesota Teacher Attitude Inventory*.
66. uses instructional principles properly in planning daily lessons.
67. plays table tennis according to rules well enough to beat three inexperienced girls 100% of the time.
68. correctly recites Gettysburg Address from memory.
69. scores 80% or better on a spelling quiz.
70. displays interest in higher mathematics by volitionally attending lectures on this topic

PART IV. PERFORMANCE STANDARDS

Part IV Directions: For the following objectives, mark A if the objective has only a student minimal level of learner behavior; B if the objective has a class minimal level of behavior; and C if the objective has no minimal level of learner behavior.

71. The class will answer correctly 10 out of 12 multiple choice questions on the Roman Empire.
72. The students will compose an essay on the topic of their summer vacation.
73. At least 10 students in the class will sign up for a senior life saving course at the conclusion of a unit on water safety.
74. Seventy-five percent of the students will understand differential equations.
75. Students will recite with no more than one error Milton's sonnet "On His Blindness".
76. 60% of the students will prepare 500 word book reports on famous social scientists.
77. The students will thoroughly comprehend at least 80% of the scientific theories treated in class.
78. The students will paint a still-life study employing two point perspective and at least three colors.
79. Everyone in class will orally recite a given Spanish dialog with no errors in pronunciation.
80. Students will be able to match chemical compounds with their valences on a written test.

PART V. CRITERION MEASURES

Part V (a) Directions: For the following list of five items distinguish between those which could be employed as educational criterion measures and those which could not by marking an A on your answer sheet for each item which could be used as a criterion to evaluate educational programs. Be careful to match the item numbers with the appropriate item on the answer sheet.

81. Standardized achievement tests
82. Locally constructed tests of pupils' progress in spelling
83. The age of learners
84. An anonymous self-report questionnaire which, among other more obvious purposes, contains a question soliciting the respondent's values regarding labor unions
85. The number of serious pencil marks, carvings, etc., on pupil desks which must be removed by maintenance personnel each summer

Part V (b) Directions: Using the four category scheme presented below, classify each of the following five lettered items by selecting the appropriate letter in the space for each item on the answer sheet.

Classes of Criterion Measures

A. Learner-behavior--natural conditions
B. Learner-behavior--manipulated conditions
C. Behavior-product--natural conditions
D. Behavior-product--manipulated conditions

86. Scores on the Kuder test of vocational interest
87. Instances of pupil misbehavior during recess periods
88. Surreptitious observations of learner behavior in nationally distributed "situational stress" tests involving accomplices
89. "Courtesy" as reflected by adolescent boys giving their seats on the bus to women who might otherwise be obliged to stand
90. Final extemporaneous speeches in senior English class

PART VI. PROTOTYPE TEST ITEMS

Part VI (a) Directions: Mark an A on the answer sheet by the number of any objective which includes a statement of presentation conditions.

91. The learner will compose in writing a four line verse.
92. The student will compare Romanticism and Victorianism literary movements.
93. The teacher will list five elements necessary in a particular geometry proof.
94. Given pictures of four colored objects, the child will circle the object which is red.

Part VI (b) Directions: For the following pair of objectives and items, mark A if the item corresponds to the objective in terms of response called for, directions, and presentation conditions. If the item does not correspond with the objective, mark B. For each objective and item you should make three responses on the answer sheet.

* * * * *

Objective: The student will write the course of action most consistent with the tenets of good citizenship outlined in class when given a social problem not previously encountered.

Item: Choose a social problem you are familiar with and in less than 300 written words describe how you would deal with it in terms of the citizenship concepts described in class.

* * * * *

Student Response (95) Directions (96) Presentation Conditions (97)

* * * * *

Objective: The student will be able to select all written notations which describe permissible moves in a chess game when presented with four choices.

Item: For the opening move by white, which of the following moves are permissible? (Check your answers.)

___(a) K-KZ ___(b) P-QN3 ___(c) N-QB3 ___(d) QB-R5

* * * * *

Student Response (98) Directions (99) Presentation Conditions (100)

PART VII. INSTRUCTIONAL SPECIFICATIONS

Part VII (a) Directions: Indicate which component of the IS is most nearly described or identified by each of the following items by marking on your answer sheet:

A. for "Terminal Behavior"
B. for "Instructional Cue"
C. for "Elicitor"
D. for "Limits"
E. for "Entering Behavior"

101. Provides rules or procedures designed to improve learner performance.
102. Contains prototype criterion items.
103. Describes the stimulus conditions under which the criterion behavior will be demonstrated.
104. Contains the information the learner requires to perform the criterion behavior.

Part VII (b) Directions: This portion of the examination consists of two terminal behavior is followed by potential components of the instructional specification. For each statement which is appropriate to its terminal behavior, whether it is a complete component or not, mark an "A" on your answer sheet. Nothing need be marked if the statement is not appropriate to the terminal behavior.

No attempt has been made to be devious or to trick you with tests of your knowledge of subject matter pertaining to each objective. You should only concern yourself with the appropriateness of the component to the terminal behavior, not authenticity of the content.

* * * * *

"To construct an equilateral triangle, given the necessary equipment."

105. Instructional Cue: "An equilateral triangle is a triangle in which all sides and angles are equal."
106. Elicitor: "Name an object that has equal sides and equal angles."
107. Limits (negative): "Triangles with less than 3 equal sides and 3 equal angles."

108. Entering Behavior: "To identify triangles, given examples of triangles, squares, and rectangles."

* * * * *

"To write the longitude and latitude of any given position on a map, given a map with longitude and latitude lines."

109. Instructional Cue: "Longitudes and latitudes are essential for locating positions on the open sea."

110. Elicitor: "Degrees latitude on the position indicated are ____, degrees longitude are ____."

PART VIII. APPROPRIATE PRACTICE
IX. KNOWLEDGE OF RESULTS
X. PROMOTING LEARNER INTEREST
XI. AVOIDING IRRELEVANCIES

Parts VIII, IX, X, and XI. Directions: First, read the short self-instruction program dealing with statistics. (You may wish to respond to the program as though you were the intended learner.) Then answer the series of examination questions

MADAM, MAY I PLEASE MEASURE YOUR CENTRAL TENDENCIES?
(A Non-Exemplary Program)

by

W. James Popham

Program Objective: At the conclusion of the program the learner will be able to select the correct numerical values of the mean, median, or mode from multiple choice alternatives when presented with a set of fictitious data.

Enroute Objective: The learner will be able to match the terms mean, median, and mode with definitions of these measures.

Enroute Objective: The learner will be able to compute the numerical value of the mean, median and mode from small sets of fictitious data.

Prerequisite Behaviors: As necessary entry behaviors, the learners should be able to read and perform the following operations with one, two, and three digit numbers: add, subtract, multiply, divide.

A. As an individual concerned with the development of instructional materials, you will encounter situations in which you wish to describe how well a group of learners performed on a criterion test after completing your instructional sequences. Ideally, this description should be supplied as parsimoniously as possible to save your time as well as those with whom you are attempting to communicate. One of the most efficient ways to describe a set of data is through the use of statistical measures of central tendency.

B. Statistical measures of central tendency are numerical indicators of the manner in which the scores of individuals in a group of scores (such as test data) tend to cluster near the center of the scale on which the scores are measured. The three measures to be treated in this program are the mean, the median, and the mode.

C. The mean is calculated by adding together all of the scores in a set of scores (also called a distribution) and then dividing them by the number of scores in the set. For example, consider the following set of seven scores: (8, 7, 5, 4, 3, 1, 0). When these scores are added together, their sum is 28. Dividing 28 by 7, the number of scores, we find that 4 is the mean. For the following set of four scores (10, 8, 8, 2) then, we can see that 7 is:

a. the mean
b. the median
c. the mode
d. none of the above

For these and subsequent items in which you are to make a choice or supply an answer, please make your response directly on the booklet, then read beyond the three asterisks. It may be necessary to mark off the section below the asterisks so that you do not inadvertently see the correct answer. For the question above, circle the letter of the best answer.

Since 7 is derived by adding all scores (28) and then dividing by the number of scores (4), it is the mean.

D. The median is the point which divides a set of scores into two equal halves. For instance, in the following set of scores (9, 9, 6, 5, 2) the number 6 splits the scores into two equal halves, hence it is the median.

E. Sometimes the median is not an actual score. See if you can determine the median for the following set of scores. This is a difficult problem and if you get it right, you will be one of the eleven per cent who answer correctly. See if you can choose the right answer and avoid the 89% stigma!

Scores: 7, 7, 6, 4, 2, 1

Median choices (circle one):

a. 6
b. 5.5
c. 5
d. 4.5

* * *

If you chose answer C you are a member of the "lofty eleven." To calculate the midpoint of this distribution, it would be necessary to interpolate between scores of 6 and 4 to obtain a 5.

F. The mode is the most frequently appearing score in a distribution. Thus, in the following set of scores (9, 8, 4, 2, 2, 1) the score 2 appears most frequently so it is the mode. What would the mode be for this set of scores (8, 8, 7, 7, 7, 2, 1)?

a. 8
b. 7
c. 2

The answer of course, is 7 since it is the most frequently appearing score.

G. It is extremely important for you to be able to distinguish between these three indices of central tendency because sometimes one of the measures is more appropriate than the others when employed to describe data. You do not want to be deluded by incorrectly assuming that the central tendency given with a distribution is always proper.

H. For instance, is a shoe manufacturer interested in making shoes which are near mean, median, or modal value of foot sizes?

a. mean
b. median
c. modal

* * *

Since he wishes to sell more shoes, he would undoubtedly emphasize shoe sizes near the modal value.

I. Much of the early literature of statistics and measurement is laden with articles concerning the efficiency of the various measures of central tendency. At least one duel is actually supposed to have been fought in England as a result of a debate regarding this subject.

J. Compute the mean for the following set of data and write your answer in the space provided.

6, 6, 5, 4, 3, 0

Your answer ________________

* * *

Your answer should have been 4. If you answered four, IV, or the square root of 16, you are also correct. The mean, as you recall, is obtained by summing all scores and dividing by the number of scores.

K. Determine the median for the following set of data.

22, 19, 14, 13, 12, 12, 8

Your answer ________________

* * *

You should have answered 13, for this is the point which separates the set of scores into two equal halves.

L. What is the mode for this distribution of scores?

48, 44, 43, 18, 12, 12, 3, 2, 2, 2, 1, 0

Your answer ________________

* * *

You should have indicated that 2 is the mode for the set of scores since it is the most frequently occurring score.

M. For the following scores determine the mean, median and mode, then circle the answers to the three questions posed below.

8, 7, 7, 6, 6, 6, 5, 4, 3, 3, 2, 2, 1, 0, 0

The mean is:	The median is:	The mode is:
a. 4.2	a. 6	a. 3
b. 5	b. 5	b. 7
c. 4	c. 4	c. 4
d. 5.2	d. 3	d. 6

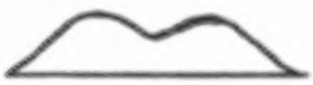
* * *

The correct answers are:

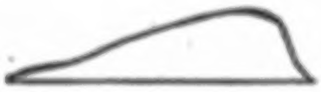
Mean = 4
Median = 4
Mode = 6

N. An interesting feature of any symmetrical distribution of scores, such as the normal curve, is that the median and the mean are at precisely the same point.

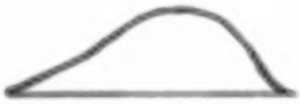
O. In which of these three distributions would the mean, median, and mode be at the same point. Circle the letter of the correct answer.



a.



b.



c.

* * *

Only in distribution C would all three measures (mean, median, mode) coincide.

P. For the following set of scores select the mean, median, and mode from the multiple choice alternatives presented below.

11, 6, 3, 3, 3, 2, 0

Mean	Median	Mode
a. 4	a. 3	a. 3
b. 3.5	b. 6	b. 3.5
c. 3	c. 3.5	c. 9

* * *

You should, hopefully, have had no trouble with this easy problem. If you are unsure, re-compute your answers.

THE END

PARTS VIII, IX, X, AND XI
EXAMINATION QUESTIONS

The previous program, of course, is not intended to be an exemplar of good programming. Several flaws were deliberately introduced for purposes of the test.

Directions: Please read each question and then on the answer sheet mark with an A the number of any frame which correctly answers the question. There may be no correct answers for each question or there may be one or more correct answers. Therefore, consider each frame carefully. Nothing need be checked on the answer sheet for incorrect frames.

Part VIII. Appropriate Practice

Equivalent appropriate practice (learner practice identical to that called for in the terminal behavior) is supplied in:

111. Frame B
112. Frame C
113. Frame D
114. Frame H
115. Frame P

Analogous appropriate practice (learner behavior comparable, but not identical to that called for in terminal behavior) is provided in:

116. Frame J
117. Frame K
118. Frame M
119. Frame N
120. Frame O

Part IX. Knowledge of Results

Knowledge of results is provided in:

121. Frame A
122. Frame B
123. Frame E
124. Frame H
125. Frame J
126. Frame K
127. Frame L
128. Frame M
129. Frame O
130. Frame P

Part X: Promoting Learner Interest

An attempt to promote interest is found in:

131. The title
132. Frame B
133. Frame C
134. Frame E
135. Frame F
136. Frame J
137. Frame K
138. Frame L
139. Frame M
140. Frame N

Part XI: Avoiding Irrelevancies

Which, if any, of the following frames are essentially irrelevant?

141. Frame C
142. Frame D
143. Frame E
144. Frame F
145. Frame H
146. Frame I
147. Frame J
148. Frame N
149. Frame O
150. Frame P

EXAMINATION: THE DEVELOPMENT OF INSTRUCTIONAL PRODUCTS

Form X (Part II)

Please write your name on this booklet.

Name ______________________________

SOUTHWEST REGIONAL LABORATORY FOR
EDUCATIONAL RESEARCH AND DEVELOPMENT

January, 1968

PART XII RESEARCH DESIGNS

Part XII Directions: Follow the instructions for each of the following five items. Write your answer directly on the answer sheet.

1. Write the name of the research design being used in this situation:

   An English teacher randomly divides his class into two subgroups of 16 pupils each, and provides one group with a newly prepared set of instructional materials on the topic of "sentence structure." The second group does not receive the new materials, but instead reads some additional literature selections. Using two comparable tests on sentence structure provided by the publishers of the instructional material, the teacher tests both groups of pupils before and after the use of the new materials.

   (1.) Name of Design:______________________________

2. Write the name of the research design being used in this situation:

   Using tardiness records during the previous 18 months, a school research committee plots a graph showing the median monthly tardiness frequency for each of the 18 months. They are particularly interested to see if there are any substantial changes in the tardiness rate during the most recent six months, since a three week anti-tardiness campaign was conducted at this time.

   (2.) Name of Design:______________________________

3. Write the name of the research design you recommend for this situation:

   A teacher wishes to evaluate the attitude shifts, if any, produced by a series of short stories dealing with minority group problems. He is reluctant, however, to give his class an attitude inventory before they read the stories because it may unnaturally focus their attention on certain aspects of the stories. He can randomly assign the stories to half of his class if he wishes, for there are other unrelated stories which can be used as "filler" material.

   (3.) Recommended Design:__________________________

4. Write the name of the research design you recommend for this situation:

   Since school has been underway for three weeks, faculty members in a high school English department agree that they cannot reconstitute already formed classes. They are, however, anxious to test the worth of a new series of group "micro-plays" dealing with punctuation skills in which various members of the class take part in short dramatic vignettes. They administer a 20 item punctuation test to all four of their classes as a preliminary measurement and find that the four classes are remarkably similar with respect to their entry knowledge regarding punctuation. For the sake of administrative convenience the teachers wish to use the micro-plays with their entire classes rather than parts of the classes.

(4.) Recommended Design:________________________

5. Write the name of the research design you recommend for this situation:

A school researcher can randomly assign 20 classroom units to experimental and control instructional treatments, but his faculty is particularly interested in contrasting performance of the two groups before and after the treatments. The researcher devises two equivalent forms of a test which he believes will not interact adversely with the treatment.

(5.) Recommended Design:________________________

PART XIII

Part XIII Directions: You are developing a one-year course of instruction that is designed to teach certain specified skills to primary-grade children. After the instructional material is developed, you plan to have several teachers try it out in their classrooms. You will revise it following the tryout.

a. Describe (in one sentence each) four procedures that you can use to increase the probability that the instructional techniques employed by the tryout teachers (as distinguished from such pupil materials for the course as the textbook and prepared tests and exercises) will yield useful data for revision purposes.

6.____

7.____

8.____

9.____

b. List three sources of evaluation information that can be used to identify revisions to be made in the course.

10._______________________________________

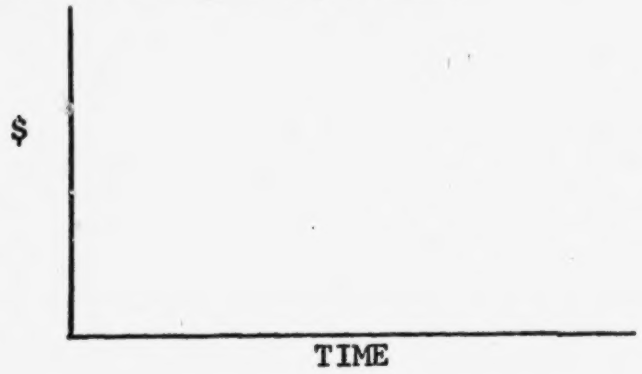
11._______________________________________

5

12._______________________________________

PART XIV

13. Using the ordinate and abscissa below, draw reasonable time-cost curves for the development, installation, and maintenance of a given product.



14. List the components of an instructional product which must be available before it can be considered ready for general use.

15. List the criteria relevant in evaluating an instructional product.

16. List the factors in a :

    a. cost efficiency ratio

b. cost effectiveness ratio

17. Suppose you are developing a new science program. In a phrase or sentence give an illustration to distinguish each of the following:

a. project

b. activity

c. task

d. generation

e. cycle

PART XV

18. Describe the strategy you would employ in deciding on an instruction sequence:

Generate an instructional sequence and classify components for the following objective:

Objective: To be able to write a 500 word essay relating mass media to their impact on politics.

		Association	Generalization
19. Prerequisite	______________________________	__________	__________
20. En Route	______________________________	__________	__________
21. En Route	______________________________	__________	__________

Label the following as association or generalization tasks.

22. ________________ To spell 10 previously encountered words correctly.

23. ________________ To factor previously encountered polynomical expressions.

24. ________________ To classify objects on the basis of color.

25. ________________ To list ten social factors which might affect the passage of a never-before seen labor bill.

26. What is the major attribute of an association task?

27. What is the major attribute of an generalization task?

PRESESSION IX

ON-LINE COMPUTER APPLICATIONS IN EDUCATIONAL RESEARCH

Director

Dr. Ronald G. Ragsdale
Ontario Institute for Studies in Education

INTRODUCTION

Announcements from the AERA Presession Committee were received requesting proposals for a 1968 Presession in early March 1967. The proposal from OISE was submitted on April 4 and included the description of Educational Theory 3556, a seminar dealing with "On-line Computer Applications in Educational Research". It further specified that the anticipated audience for the presession would be made up of educational researchers with little or no formal computer training, who anticipated the need for using computers in some way other than routine data processing.

On April 10, word was received that this proposal had been accepted as one of the eleven presessions to be held in February 1968.

OBJECTIVES

The October 1967 issue of the Educational Researcher contained listings of the content and objectives for all eleven presessions. For Presession IX it stated:

> "Content and Objectives. Objectives are to enable the participants to choose intelligently among the various electronic alternatives to accomplish a given task, to work effectively with computer specialists, and to make efficient use of computer hardware and software as it is likely to be available during the next five years, especially in those applications other than batch processing. The presession will include an introduction to the rationale, hardware configurations, available software, and applications of time-sharing computer systems. On-line computer applications which the presession will cover in more detail are those not generally provided by the commercial systems, of which the most common is the use of the computer to monitor the progress of and collect the data from an ongoing experiment. Simulation and information retrieval will be covered, along with graphic input and output. Finally, participants will outline a research project involving some on-line computer applications."

STAFF

Director:

Dr. Ronald G. Ragsdale
Department of Computer Applications
The Ontario Institute for Studies in Education
102 Bloor Street West
Toronto 5, Ontario

Instructional Staff:

Dr. Leslie D. McLean
Department of Computer Applications
The Ontario Institute for Studies in Education
102 Bloor Street West
Toronto 5, Ontario

Dr. Stacy Churchill
Department of Computer Applications
The Ontario Institute for Studies in Education
102 Bloor Street West
Toronto 5, Ontario.

Dr. Maurice Constant
University of Waterloo
Waterloo, Ontario.

Graduate Assistants:

John Cornfield
Department of Computer Applications
The Ontario Institute for Studies in Education
102 Bloor Street West
Toronto 5, Ontario

Paul Barbuto
Department of Computer Applications
The Ontario Institute for Studies in Education
102 Bloor Street West
Toronto 5, Ontario.

DESCRIPTION OF PARTICIPANTS

Forty-five applications were received, six being from individuals whose applications were not accepted at the presession of their first choice. Since no selection was made, all were considered as future participants in our presession, only eleven of the forty-five having attended any previous presession.

During the last weeks in January, seven of those invited declined, with an additional reduction of one appearing on the first day. Thus the total number taking part in the activities was 37. The names and addresses follow this section.

In the second week of January, a superficial analysis was made of the biographical data available on the application forms and distributed to the staff to assist in the final planning of the sessions. Included with this was a names list, a map showing the geographic distribution of the participants, and a table indicating the educational background and expressed interests of each individual. These latter three items were also mailed to the participants, attached to the second contact letter (See Appendix #1) with the names on the table deleted. The complete table is shown on the last page of this section.

The following updates the analysis referenced above:

Sex - 35 Male, 2 Female
Age - Mean of 36.4 years
Degrees - All held the M.A., 32 holding the Ph.D.
Time Allocation - Mean of Time Teaching 42.5%
Mean of Time in Research 41.8%
One participant was a full time teacher, and four were full time researchers.
Teaching Activity - Mean of 2.5 courses per individual, 1.0 at the undergraduate level and 1.5 at the graduate level, the maximum number of courses being taught by any one individual being 4.
Publications - Journal: Mean 2.1 /person
- Total: Mean 6.2 /person
Funded Projects - Mean of 3.3 /person for n=12
Courses Taken - See table (this section)
Research Interests - See table (this section)

The table also includes an estimation of the level of computing experience of each participant, using the following scale:

1 - Frequent use of packaged programs for batch processing
2 - Programing experience
3 - Systems Design and Analysis

A look at this portion of the table, indicates the heterogeneity of their backgrounds with which the staff had to deal.

LIST OF PARTICIPANTS

BELTON, John
Supervisor of Research
Board of School Directors
5225 W. Vliet Street
Milwaukee, Wisconsin 53208

BLUMENFELD, Gerald J.
Southern Illinois University
107 S. Rod Lane
Carbondale, Illinois 62901

BOYSEN, Charles
Follett Publishing Company
1010 West Washington Blvd
Chicago 60607

BRAUN, P.N.
Project Sesame
Coordination Under Title III, ESEA
Region L Curriculum Center
Department of Education
Bucknell University
Lewisburg, Penns. 17837

BRINK, J.
State University College
1300 Elmwood Ave
Buffalo, N.Y. 14222

CADWALLADER, T.C.
Indiana State University
Terre Haute, Indiana 47809

CARTER, Boyd
408 East 15th Street
Bowling Green, Kentucky 42101

CHADBOURN, R.A.
University of Colorado
Laboratory of Educational Research
Boulder, Colorado 80302

ELDER, R.D.
Kent State University
Child Study Center
Kent, Ohio 44240

CANFIELD, Earle R.
Graduage Division
Drake University
Des Moines, Iowa 50311

FISHER, I.S.
Miami-Dada Jr. College
11380 N.W. 27 Ave
Miami, Florida   33167

FLEMING, Malcolm
Indiana University
Audio Visual Center
Bloomington, Indiana 47401

HALL, A.E.
Department of Psychology
The College of Wooster
Wooster, Ohio 44691

HEISEY, D.J.
Department of Mathematics
University of New Hampshire
Durham, New Hampshire 03824

HELLER, J.
The University of Connecticut
Storrs, Connecticut, 06268

HICKROD, G.A.
Illinois State University
Normal, Illinois 71761

HUNTINGTON, J.F.
Miami University
School of Education
Oxford, Ohio 45056

INGWELL, P.E.
Stewart Hall, Room 115
St. Cloud State College
St. Cloud, Minnesota

JOSEPH, M.P.
Work Opportunity Center
107 Fourth Street Southeast
Minneapolis, Minnesota 55414

KARAS, S.F.
Southern Connecticut State College
86 Bradley St.
North Haven, Conn. 06473

LUCACCINI, L.F.
Educational Resident
Dept. of Health, Education & Welfare
Dental Health Center
14th Avenue & Lake Street
San Francisco, Calif. 94118

MARTORELLA, PH.
Temple University
College of Education
Philadelphia, Penns. 19122

McCONKIE, G.W.
Department of Education
Cornell University
Ithaca, N.Y. 14850

McKIE, D.
Department of Education
The University of British Columbia
Vancouver 8, B.C. Canada.

MERRILL, M.D.
School of Education
Stanford University
Stanford, Calif. 94305

MILES, M.B.
Teachers College Columbia
New York, New York 10027

McLAIN, T
Monterey County
Office of Education
P.O. Box 851
Salinas, California 93901

OLIVER, W.C.
ERIC Evaluation Center
1034 East Adams
Tucson, Arizona 85719

PATTON, D.C.
Purdue University
Department of Education
Lafayette, Indiana 47907

PERSONS, E.A.
University of Minnesota
2173 Commonwealth Ave
St. Paul 8, Minnesota 55108

PFEIFFER, M.G.
La Salle College
350 2nd Ave
Philadelphia, Pa. 19111

RENZULLI, J.S.
The School of Education U-64
The University of Connecticut
Storrs, Conn. 06268

RYAN, M.D.
Office of Institutional Research
St. Joseph's College
Rensselaer, Indiana 47978

SCHROCK, S.A.
Educational Research Council of America
18645 Detroit Ave
Apt. 315
Lakewood, Ohio 44107

SEFEIN, N.E.
State University College
Fredonia, N.Y. 14063

TURNEY, B.L.
North Texas State University
Dept. of Educational Psychology
Denton, Texas 76203

WIGHTMAN, L.E.
School of Education
University of Massachusetts
Amherst, Mass. 01003

Participant Information

Nan	Background					Expressed Interests						
	Com.Expertise		Sel. Ed. History No. Of Courses			Primary Research				Application Are		
	Number of Courses	Level of Experience	Psychology and Sociology	Mathematics	Stat., Meas., Exp. Design	Administration and Economics	Curriculum & Instruction	Psychology or Sociology	Exp. Design and Analysis	Instruction	Research	Data Processing
lton, J.R.	1	1	12	2	9	-	*	-	-	*	*	*
umenfeld, G.J.	-	-	12	6	7	-	-	*	-	*	*	-
ysen, C.												
ann, P.W.	-	-	5	24	1	-	*	*	-	*	-	-
unk, J.W.	-	-	8	3	2	-	*	*	-	*	*	-
dwallader, T.C.	-	-	25	-	3	-	-	*	-	-	*	-
nfield, E.L.	-	-	-	16	8	-	-	-	*	-	*	-
dbourn, R.A.	3	3	7	20	7	-	*	-	*	*	*	-
der, R.D.	-	-	10	2	6	-	*	*	-	-	*	-
eming, M.L.	-	-	4	2	4	-	-	*	-	-	*	-
sher, I.S.	1	-	23	-	12	-	*	-	*	-	*	*
ll, A.E.	1	-	40	15	12	-	-	*	*	*	*	-
isey, D.J.	1	2	4	42	5	-	*	*	-	*	*	-
ller, J.J.	1	1	8	-	10	-	-	*	-	-	*	-
ckrod, G.A.	-	-	5	-	5	*	-	-	-	-	-	*
ntington, J.F.	-	1	20	10	9	-	*	*	-	-	*	*
gwell, P.E.	1	1	13	10	9	-	*	*	*	-	*	-
seph, M.P.	-	-	22	14	12	-	*	*	-	*	-	-
ras, S.F.	1	1	7	20	17	-	-	*	*	-	*	-
caccini, L.F.	5	2	22	6	9	-	*	-	*	*	*	-
rtorella, P.H.	-	-	11	8	4	-	*	-	-	*	*	-
rrill, H.D.	1	2	15	8	8	-	*	-	-	*	*	-
les, M.B.	-	-	25	4	3	-	*	*	-	*	*	-
Conkie, G.W.	-	-	27	3	6	-	*	-	-	-	*	-
Kie, D.	-	-	2	15	14	-	*	*	-	*	-	*
Lain, T.	10	3	16	5	5	-	*	*	*	*	-	*
iver, W.C.	-	-	15	2	9	-	*	-	-	*	*	-
tton, D.C.	-	1	6	9	6	*	-	-	*	-	*	-
rsons, E.A.	-	1	2	-	6	-	*	-	-	*	-	*
eiffer, H.G.	-	1	52	2	4	-	*	*	-	-	*	-
nzulli, J.S.	1	-	10	5	10	-	-	*	-	*	*	-
an, M.D.	1	1	21	-	7	*	-	-	-	-	*	-
hrock, S.A.	-	-	1	1	1	-	-	-	*	-	*	*
fe N.E.	-	-	4	-	8	-	*	*	-	*	*	-
rney, B.L.	1	-	15	51	33	-	-	-	*	-	*	-
ghtman, L.E.	1	3	16	2	6	-	*	*	-	*	*	-

CONTACTS

All participants were contacted twice before the presession started, in December and late January.

The first letter (see Appendix #1) informed them of their acceptance, and gave details concerning the logistics of holding the presession at Pheasant Run Lodge. In addition, it indicated the contents to be expected in the second mailing.

The letter of Jan. 22 (See Appendix #2) outlined the content and format of the morning and afternoon sessions, and stressed that the primary objective of the presession was the incorporation of an on-line computer application into a research proposal. The other activities that the participants were expected to take part in were described. Attachments to this letter were, the list of names, map and table described in 4. above, and an outline of the facilities at the Lodge.

No reading material was forwarded, it being indicated that such was to be collected at registration (See II,2).

SCHEDULE OF EVENTS

Participants arrived at Pheasant Run Lodge, St. Charles, Illinois during the day preceeding the commencement of the presession. Arrangements for travel and funding of their stay were left to each participant. A notice was posted requesting the participants to take part in preliminary interviews on Friday evening. At this time they were given a short pretest on the GE Computer Terminal and were also interviewed (see III, 4).

The formal opening was held on Saturday morning, February 3, when a brief statement of the purposes of the presession was given by the Director. Each staff member was introduced and the first administration of the Semantic Differential was carried out. The morning lecture was on "Time-sharing Hardware Configurations" (L.D. McLean), and the afternoon was on "Time-sharing Software Configurations" (Stacy Churchill). In the evening, movies on time-sharing were shown and participants who had missed the Friday evening session were requested to take part in the preliminary interviews.

On Sunday morning, the lecture was on "Application Programs on Time-sharing Systems" (R.G. Ragsdale), while the afternoon involved two parallel group sessions. One was a workshop on "Conversational Programing" (S. Churchill) and the other on "Data Analysis" (L.D. McLean). There was a break in mid-afternoon to allow the participants to switch sessions. On Sunday evening, movies were again shown and a workshop on FOCAL Programing was held.

The Monday morning lecture was on "Control of Experiments" (R.G. Ragsdale) while the afternoon was devoted to a lecture on "Graphics" (M. Constant) supplemented by films. On Monday evening, the individual staff members led small group discussions and the computer terminal was available for participant use. In fact, from this point on, participants were allowed to sign up for blocks of terminal time.

The Tuesday morning session was split between "Simulation" (R.G. Ragsdale) and "Graphics" (M. Constant), while the afternoon session was devoted primarily to "Graphics" (M. Constant), with participants and staff filling out evaluation material at the end. In the evening, individual staff members were available for consultation with the exception of Maurice Constant who was showing films on Graphics. The computer terminal was still in use and participants who had been interviewed at the beginning of the presession, were requested to again take part in the interview procedure.

Wednesday morning individual staff members were again available for consultation and the IBM Data Text terminal was demonstrated. Wednesday afternoon, a brief talk on "Data Communications" (R.G. Ragsdale) was given until the bus arrived for transportation to the AERA Meeting.

MATERIALS

Instructional

Digital Small Computer Handbook for New PDP 8/1 Computer, Digital Equipment Corporation, 399 pp - a primer on computers in general with special emphasis on small computers and their applications.

User's Guide to FOCAL, Department of Computer Applications, The Ontario Institute for Studies in Education, 50 pp - a description of, and the rationale behind, FOCAL: an instructional language for an on-line system.

Data Analysis: Realizations and Needs, F. Pysh, Department of Computer Applications, The Ontario Institute for Studies in Education, 37 pp - a summary reviewing the more recent contributions to data analysis in terms of hardware, software and "brainware" (conceptual advances) and examining how these components might still further be amalgamated into a more viable mix so as to achieve the goals of data analysis.

On-line Assistance in the Design and Control of Psychological Experiments, J. Cornfield, Department of Computer Applications, The Ontario Institute for Studies in Education, 28 pp - presents implications as to the changes required in the design, analysis and control of psychological experiments because of on-line capabilities, along with examples of recent applications.

Educational Data Banks, Mancel R. Ellis, Department of Computer Applications, The Ontario Institute for Studies in Education, 24 pp - a review of the manner in which developments in the field of information retrieval have been applied to educational problems.

Simulation and Programed Intelligence: An Introductory Paper, Kenneth Tunstall, Department of Computer Applications, The Ontario Institute for Studies in Education, 12 pp - presents background terms, definitions, and concepts, plus examples of simulation and artificial intelligence.

Evaluative

Five different forms of evaluation were used, each of which is described below:

a. Semantic Differential: The semantic differential is an attempt to measure the meanings of certain concepts, and in our case the change in meaning, with reference to the "semantic meaning space" as defined by Osgood, *et al*. The dimensions of this assumed Euclidian space have been studied by factor analytic methods, and use of such studies were made in the selection of the scales used.

It was decided to use this form of evaluation rather than an achievement form or mastery test since analyses of previous presessions showed little information was gained from the latter techniques. High gains in achievement always occurred because of the motivation and abilities of the participants Since the majority of the participants in our presession would be coming in contact with the concepts of "on-line" and "time-sharing" for the first time, and specifically in connection with educational activities, it was decided that an attempt to measure changes in the attitudes and values with which they viewed these and associated concepts in an educational context, would yield more significant information than would achievement tests.

Appendix #3 contains the semantic differential instrument. It was administered twice, on the morning of the first day, and in the afternoon of the last full day at the conclusion of the formal session activities.

The majority of the 15 concepts were chosen in relation to the specified objectives of the staff concerning the content of the formal session, quite often occurring in the title of a specific session. The remaining concepts dealt with topic areas to be dealt with in the discussion groups, terminal activity or with computers in general.

The scales, chosen from Osgood, were those which had high factor loadings on specific identified dimensions. Four scales each for the "evaluative", "potency" and "activity" dimensions, and three for that of the "stability" dimension. As well as the factorial composition, the scale relevancy to the selected concepts was taken into consideration.

It is recognized that any interpretation made on the analysis of the data gathered by such an instrument must be considered in the light of the assumptions on which its design is based (for example semantic stability over concepts and subjects, scale linearity, etc.) and against indices such as reliability and validity for the instrument concerned.

b. Formative Evaluations: Formative evaluation was carried out twice (formally) during the presession in order to use participant feedback to other session content/format. Numerous informal interactions were used to the same end.

The choice of the form used was based on the indicated participant variability and the design of the session activities.

Sheet No. 1 (Appendix #4) was filled out at the end of the first day to assess the activities of the morning and afternoon sessions. Sheet No. 2 (Appendix #5) was completed on the morning of the third day and covered the activities of the two previous evenings.

The subsequent analysis of the responses made on these forms was used to alter the remaining sessions to which they each pertained (Section II, 4).

c. Presession Critiques: Two sets of these were provided by AERA, and administered to all staff and participants of all presessions. In our case they were filled out at the end of the afternoon session on the last full day. It was felt that this was the most opportune time since the participants were to spend the remaining evening and morning working on individual proposals.

The forms appear in Apendix 6/7, along with the tally of responses. The summary of the responses is in sections III, 2 and III, 3.

d. Interviews: OISE supported the attendance of Mr. D.G. Crawford of the Department of Computer Applications, at presession No. IX, for the purpose of obtaining an independent evaluation by the means of personal interviews. The first set of interviews were completed on Friday evening before the presession had formally started, and the post interviews were carried out in the evening of the last full day.

e. Proposals: A stated objective of the presession was the preparation of a proposal by each participant. These would be evaluated by the staff, and returned with comments during March. This allowed each participant to apply the knowledge obtained in the sessions to his own interests, and it allowed the staff to ascertain the value of the content of the presession to the specific individual.

Formative Evaluation

Sheet 1 (see appendix 4 for a listing of actual responses) At the end of the first day, 37 forms were completed, 10 containing detailed comments, 17 a few, and 10 having only the charts filled in. A few of the forms dealt specifically with the morning or afternoon session, and were directed to the instructor in charge. These latter forms were summarized and given to the specific instructor, and are not included in the appendix or following summary. This deals with the combined sessions.

a. Content: The general feeling was that the depth to which the presented material was going and the theoretical aspects involved should both be decreased and a far greater stress put on the practical aspects of time-sharing that they, as potential users, would have to face. This emphasis was present in both the constructed and free responses. Accompanying this were suggestions to decrease the volume of technical vocabulary used and if it were necessary,to define it carefully.

The great variability in the general comments again indicated the range of interests and abilities the staff had to contend with. One individual felt the day could have been compressed into 30 minutes ; another was lost within the first 30 minutes!

b. Format: The methods used for presentation of the material were considered satisfactory with a few suggesting early break-up into small group discussions.

The feedback from formative evaluation sheet No. 1 was discussed by the staff in the late evening of the first day. Taking into consideration the general impressions of the participants, the subsequent morning and afternoon sessions were reduced with regards to the level of technical sophistication and greater reference was made where possible, to the practical aspects of the content under discussion.

Sheet 2 (see appendix 5 for a listing of actual responses)

a. Films: A range of opinions was given on the film shown the first two days. In general the attitudes were positive, and these were reinforced by the films shown subsequently involving computer graphics. The commercial orientation of many films is a factor that must be contended with when the film is used with a group having specific interests.

b. Computer Terminal Activity: The use of the one terminal available was high, and in general appreciated. For many, this was the first "hands-on" experience with an on-line facility and a number requested more instruction in programing, both in BASIC and FOCAL.

Because of the interest indicated, a schedule was devised for the allotment of terminal time, and since the room which contained the terminal was usually locked, 24 hour accessibility to the key was arranged.

c. Discussion Groups: Two specific areas of concern showed up on the analysis of this portion of the feedback data. The first was the interest in specific, small, structured, discussion groups; the second being the availability of the staff for private consultations.

It was on the basis of this that the late afternoon and early evening of the third day saw the six staff members in specific locations, dealing with topics suggested by the participants.

The evening replicated the afternoon in order that each participant could attend the two of greatest interest.

The evening of the 4th day was left free, with the staff again being available in specific locations for private informal consultation. In addition to satisfying the initiating request, those beginning to feel oppressed by the work load found relief.

d. General: As apparent by the comments on this section of the form, the participants were beginning to get a "feel" of the problems and prospects of on-line use of computers in education. This was indicated by the number of specific questions and suggestions made, and the interest the majority showed in attempting to relate the application to their own areas of interest.

A few felt that time was being wasted, others requested more time to assimilate the information being confronted.

EVALUATION

1. Non-Mastery Outcomes - Analysis of the semantic differential

When one emerges from the "promised-land" of the computers'future into the reality of computer services as they exist today, the contrast can be most painful. The quantity of data generated by two administrations of the semantic differential forced us to rely on present off-line computer services. As a result there are no comments that can be made about the analysis of the data at this time. This analysis will be published separately when it becomes available.

2. Summary of Staff Critiques

The following is an attempt to summarize the responses of the six staff members, entered on the presession critique forms. Objectivity is the goal, however readers are referred to Appendix 6 for a tally of the responses.

a. Environmental Conditions: Generally satisfactory. The classroom used was considered to be more than satisfactory. However, half the staff thought additional resource material/sources were necessary. A dichotomy also occurred on the eating facilities, 3 considering them unsatisfactory.

b. Participants: The staff was satisfied with the participants except in two areas. They felt that some lacked the appropriate academic background, and all but one of the staff considered the participants to be unprepared for the presession.

c. Organization: Half the staff felt that insufficient planning had gone into the presession and the running was not as smooth as it could have been. The majority, however, considered that the staff was to be commended on their sensitivity to the grievances of the participants and their adaptability to the obstacles and feedback.

d. Schedule: Five days were adequate for the job, however the time was not spent as efficiently as it could have been, and possibly an alternative sequence would have been more effective. Both the quantity and quality of the discussions held were considered to be commendable.

e. Outcomes: The staff considered the outcomes satisfactory. Two of the members did not feel that adequate improvement in attitudes toward research had been achieved, however all agreed that the improvement in participant understanding was more than satisfactory.

f. General: (Summary of questions 6 - 13) Two thirds of the staff felt that the organization could have been a little "tighter". Flexibility and adaptability was considered necessary, however, because of the spectrum of interests and abilities displayed by the participants. Being more selective in choosing participants, keeping the level practical, and having lots of handouts and visuals, would be modifications for improvement. The grouping used for discussions was adequate, but in future should be considered more carefully if participant heterogeneity is to be coped with adequately. Half the staff did not consider the facilities adequate for what they had planned, and two felt that more terminals should have been provided. Two felt that presessions should be held in the same location as the annual meeting, the remainder feeling this was not necessary. In general, the staff felt that they benefited personally by the experience, through the personal interactions with other researchers. All would urge their colleagues to become staff members of future presessions. In regards to this presession, they were in full agreement that their personal objectives had been attained.

3. Summary of Participant Critiques

27 of the 37 participants completed the critique at the end of the last full day, 2 sending their responses in later by mail. The following is a summary of these responses, the response tally appearing in appendix 7.

a. Environment and Facilities: The majority felt that the materials given out by the staff were adequate, and that the unavailability of books or journals did not interfere with the mastery of the content presented. Both the living quarters and meeting rooms were satisfactory, and there was no lack of a place to work, either individually or in groups. A few felt that the scattered rooms, and the fact that the hotel was "isolated", were detrimental features, in addition to poor audio-visual aids.

b. Scheduling and Organization: Although most considered 5 days was not too long to be away from their work, about a third felt that the material presented in the presession could have been covered in 2 or 3 days. The number of meetings held per day was satisfactory, including the evening sessions, and enough time was left to pursue individual interests.

The lectures were not too long, but about a third of the participants thought that the sequence was not apparent, or was inappropriate. The instructors were easily accessible and approachable, and the student assistants helpful.

16 of the 29 participants completing the critique considered the presession to be not well organized.

c. Content and Presentation: About half of the participants felt that the content was relevant to their expectations, the remainder feeling that only specific topics were. The content did not presuppose training far in excess to what they had, only 8 saying that it did. The general feeling was that the backgrounds were sufficient, but because of the variation in areas, the only method of handling the problem was by grouping.

Rating the lecturers was difficult since there seemed to be decided feelings about each, with a specific individual being mentioned in a number of cases. The majority felt the lecturers were competent to speak on the subject, but had poor delivery, and sometimes appeared to be ill-prepared. Whether the lecture was interesting or stimulating was dependent on who the lecturer was.

d. Participants: The participants were not disappointed with each other, except in a few cases where comments concerning the heterogeneity, or dominance of class interaction by a few individuals were made.

e. Value of the Presession in General: (questions 15 - 21 on Critique, Appendix 7) Since the answer to these 7 questions are Yes or No, better appreciation of the participants' feelings can be obtained by referring to the actual response tally. A number of individuals attached comments to the bottom of the forms, and these are listed beneath question 21 on the tally.

4. Report on Personal Interviews -Pre-Session Interviews.

a. Expectations: Twenty-five of the thirty-five AERA Presession participants were interviewed before exposure to the presession with a view to determining first, what hopes and expectations they brought with them to the sessions, and second, what changes in professional activity might ensue as a result of exposure to the sessions.

Four general expectations seemed to be harbored by the interviewees in decreasing order of frequency of expression:

1) Research: First, a wide array of general concerns were expressed about what changes in research design would be necessitated by application of on-line computer techniques. Second, a general interest in computer-based data explorations and analysis was expressed. Finally, an array of specific interests were generated in on-line computer applications and experimental control via the computer with some respondents speaking very specifically about problems they brought with them, which included multiple R, anova, examination of physiological reactions in real-time, verbal data analysis, and the like.

2) Computers (general): There seemed to be considerable interest in computer hardware especially in terms of being able to discover some of the limitations of and make comparisons between computer hardware offerings. Interest in software was directed to the hope of being able to make critical comparisons between the various kinds of software necessary for data translation and the problems in training relatively naive users in the development of computer software.

3) CAI: A very general interest was expressed by some of the participants in CAI with specific interests being restricted largely to problems in audio storage, graphic display problems, and examining the capabilities of CAI languages and their portability.

4) General: A scattering of general hopes were expressed, such as a desire to become more competent in either using computers or talking about their use to colleagues. Some expected to pick up a concrete skill such as being able to interpret computer print-out, and some hoped to carry away specific research ideas.

b. Change in Professional Activity: If expectations were realized as a result of the presession, it was hoped first of all that a research proposal could be developed on return, and the problem either begun or the proposal submitted for funding. Others hoped that they would be able to make some decisions concerning the applicability of on-line applications to research problems in general. A second change in activity anticipated had to do with the hope that information gleaned from the sessions, when disseminated, would have high "arousal" value among both colleagues and students. Finally, some hoped to be able to make clear to their co-workers the implications of CAI at the University Level.

Post-Session Interviews

Fifteen of the twenty-five "Pre-Session" interviewees volunteered for the "Post-Session" interviews. Three general questions were posed to the respondents. First, were their expectations realized? This is, was the payoff worth the output of energy, time and money? Second, what feature of the sessions did they like the most (least) and where or why did the sessions succeed or fail? And finally, they were asked to generate a critical behavioral incident which they considered to be an outstanding teaching technique and to elaborate why the particular technique was effective or ineffective.

a. Payoff: Of the fifteen respondents, eleven decided there was adequate payoff and that they would recommend to their acquaintances that they attend a similar presession. Four voted "no". Those who voted "yes" emphasized their pleasure with the general level and amount of information they had gained, making little specific reference to detail. However, details were mentioned later on, as will be elaborated below. Most expressed the view that they will be using this information either in a personal way for decision-making, or will pass on the information they have gained to their colleagues or students. The "no's" generally were unhappy with the fact that they were unable to gather enough information to get specific answers to problems with which they came.

b. Like Most: First, the graphics presentation seemed most important to them either because of the presentation style, or because of the implications of the content. There seemed to be a "novelty effect" here associated with their opinions. Second, they seemed to enjoy the interaction with the people at the presession. That is, interacting with those with similar problems and interests seemed to be very important, either in an informal or semi-structured setting. Third, the flexibility of the program seemed important and they were impressed with the fact that they were able to shift from area to area and that the staff seemed to be knowledgeable and available during this shifting. One to one, face to face relations were important in the context of a "responsive environment". Finally, the hands-on activity and program writing experiences in both FOCAL and WIZARD, next to the Graphics, were specific experiences that were enjoyed the most.

c. Dislike: The reactions here were much more diverse and generated a great deal more detail than the pleasureable reactions. First, the most common complaint involved the location of the presession for such reasons as the cost, the isolation, and the general lack of university facilities. Specific dislikes were very diverse, but seemed to really boil down to the fact that because of the heterogeneity of the group, the presession content was either too sophisticated or too shallow. The number of complaints registered was about 30 - 50. Other than content specifics, the other complaints that seemed to cluster in a very diversified group of complaints were the fact that the title was somewhat misleading and that the content of the program seemed to stray away from implications of the title. Finally, it was felt that the sessions were far too long and dull at the beginning, being overly tiring for them, and then dragged on far too long over the last day or so.

d. Suggested Improvements: By far the most frequently mentioned improvement had to do with a cluster of concrete, specific problems related to organization which ranged over a wide area. Many felt that the organizational issues could have been much more readily handled had the group been more homogeneous. Homogenization, it was believed, should have been accomplished after the first day, with interest groups being brought together. Many specific ways were suggested for so doing. Secondly, content areas perhaps could have been detailed ahead of time for both the day and night sessions and while the emphasis could be altered to suit the needs of those who showed up for the session, a concerted effort should have been made to stick to the topic.

The second most frequently mentioned suggestion had to do with the need for more socialization, including informal sessions over food and drink with a view to uncovering interest communalities. Finally, a scattering of suggestions concerning a desire to see equipment and displays, were expressed so that critical comparisons could have been made by the administrators present.

e. Critical Incidents: Critical behavioral incidents usually included some reference to a member of the staff. These comments have been made available to the staff involved on request. In general, "positive" incidents dealt with all attempts to use audio-visual aids. Even though the attempts to use the AV didn't always work, they were still appreciated. The second most important area concerned lecture style or expository technique, which stressed the importance of enthusiastic delivery and demonstrations of audience sensitivity, in terms of both gearing the "level" of the content appropriately and detecting apathy, disinterest, etc.

There was no clustering of "negative" incidents. Most were directed to individual staff. There seemed to be, however, a general failure on the part of the staff to process information feedback from the group regarding its needs for specific content requirements.

5. Follow-Up

Subsequent to the AERA Convention, the 37 participants were sent a request form (Appendix #8) to provide an efficient conclusion to the activities. Thirty-two of these were returned.

All those who were absent for the second administration of the semantic differential agreed to complete it. Of the 10 outstanding presession critique forms, 5 would be completed. A bibliography, prepared on the "Graphic" content of the sessions was sent out to those requesting it along with these evaluation forms. The interest in the bibliography (30) was likely responsible for the high return (32/37) of the original request forms.

At the close of the presession, only 12 research proposals had been submitted for comments, the request forms indicating that an additional 6 would be forwarded. Thus only 18 or 49% of the participants achieved the primary objective set for the presession - the incorporation of an on-line computer application in such a proposal.

The proposals were distributed to at least two of the staff for comments and suggestions, and returned with these, by the Director, to the originating individual.

The proposals can be divided into three main groups: One deals with specific, detailed items of research, another with the viability of on-line methods for the general research program of an institution or project, and the third with some personal plans for continuing study.

Well more than one-half of the proposals submitted seemed to be feasible and worthwhile. The general lack of prior computer experience among the participants make this a relatively large proportion, even if one takes into account the fact that a number of participants did not submit a proposal at all.

SUMMARY

1. Presession summary

Thirty-seven educational research workers met for four and one-half days in February 1968 to learn more about on-line computer applications in educational research. The meeting was sponsored by the American Educational Research Association as a presession to its annual meeting. The United States Office of Education underwrote part of the expense.

Eight of the twelve sessions were lecture sessions. The content of the lectures concerned types of hardware and software configurations in time-sharing sessions and several areas of application to educational research and an evaluation of this meeting was carried out.

The participants were a heterogeneous group in terms of previous course work, areas of specialization, age and aspiration. Most of those selected to participate were persons who had completed doctoral programs and who had held responsibility for research. There was a considerable enthusiasm at the outset and some sense of gratification at the end. The participants were varied in their expression of appreciation for the training opportunity.

Among the side effect benefits were making of new contacts and the exchange of ideas with an intelligent and energetic group of colleagues.

The primary contributors to the success of the presession appeared to be the timeliness of the subject matter, the earnest receptivity and willing diligence of the participants, and the comfort and freedom from distraction of the resort at which it was held.

2. Issues, Comments, and Recommendations

a. Participants: The backgrounds of the participants were extremely varied, probably because there was no selection of participants. It is not certain that selection of participants would have reduced this variability significantly, but hopefully it would have. The only recommendation that can be made is that steps be taken in the future to ensure that there are enough applicants so that there can be some selection. The applicants might also be asked to set their goals when applying for a presession, and should be made to be quite specific about what they want and expect. This information could be even more useful than information about the applicants' prior experience.

b. Staff: Adequate statements about the expertise, compatibility and availability of staff and assistants have already been made in previous presession reports.

c. Facilities: Although there were many complaints about the prices at the meeting site, the total expense was no higher than for most other presessions. The factor which contributed to the participants' displeasure was that meals were on an individual basis, rather than having a flat rate for the presession rooms and meals. This served to remind each participant several times a day that the meals were expensive. A flat rate for the equivalent amount would only have reminded them once and is probably the preferable way of handling the expenses. In other respects, the facilities seemed quite adequate--the meeting rooms were large, comfortable and there were adequate diversionary activities.

There probably should be some comment about proximity of other related presessions. This presession was held at the same location as Presession VII "The Computer and Natural Language." There were some activities shared by the two presessions and in general it seems worthwhile to try and put related presessions in a common location.

d. Entire Presessions Program: It is probably worthwhile to consider whether all AERA Training Programs should be concentrated as presessions. The length of time involved for people who participate in the presessions and the AERA meetings as well, is quite exhausting. The AERA might consider a program similar to that operated by the Association for Computing Machinery (ACM). The ACM sponsors a number of travelling "Professional Development Seminars" of one or more days. The expenses of these seminars are partially offset by registration fees and the expense to participants is reduced by offering the seminars at various geographical locations.

In determining the number of presessions to be held in future, the AERA will have to consider the size of the population of available participants. It may be that the number of presessions is reaching saturation. It is especially interesting to note that many of the participants in this presession also participated in presessions in previous years.

One further comment on the length of the presessions--although it has been stated several times that presessions need not be five days long, they do tend to be five days long. There should probably be further encouragement to the use of shorter presessions.

MEMORANDUM January 22, 1968

TO: Participants in AERA presession - "On-line Applications"

FROM: Ronald G. Ragsdale, Director.

As the time of the presession draws nigh, it becomes very apparent that the group of participants comes from heterogeneous backgrounds. The staff is attempting to deal with this heterogeneity in order to make the presession a useful experience for as many participants as possible.

We have set up a schedule of lecture-type sessions which will give us a starting point from which to branch. With four staff members and two graduate assistants, we have the opportunity to set up many special groups. We will be soliciting feedback to guide us in any restructuring.

The primary objective of the presession is to give each participant enough information so that he can incorporate on-line computer applications into a research proposal. Since you will be asked to do this on the final day, it behooves you to consider what information you will have to demand in order to consider what information you will have to demand in order to write your proposal. Some information about participants is enclosed so that you may anticipate your special needs.

The presession schedule calls for the evenings of February 3-6 to be devoted to films, discussion groups and time on computer terminals. The mornings and afternoons * of these days will be devoted to time-sharing hardware and applications programs on Feb. 3; time-sharing software and conversational programming on Feb. 4; control of experiments and data analysis (and graphics) on Feb.5; simulation (and graphics) and information retrieval (and graphics) on Feb. 6. The final day will have small group applications discussions to tie up loose ends and proposal writing. Those who are going to the AERA may use the chartered bus leaving about 4:00 p.m.

We plan to have a pre-test which will be administered by a GE time-sharing terminal on Feb. 2 as people check in. Make sure you check this before you retire. We should also have some reading material to distribute at that time.

For those of you who will not have time to investigate the many features of Pheasant Run Lodge during your stay, a summary list is enclosed.

One final note. Presession Number 7 on "The Computer and Natural Language" is also being held at Pheasant Run. Although there is no formal interaction planned, we hope to share some of their experiences.

* Mornings and afternoons are probably 9-12 and 2-5. Evenings will be more vaguely defined.

Personnel - (OISE - Toronto)

Director: Ronald G. Ragsdale
Staff: Maurice Constant*, Stacy Churchill, Les McLean
Assistants: Paul Barbuto, John Cornfield

* University of Waterloo

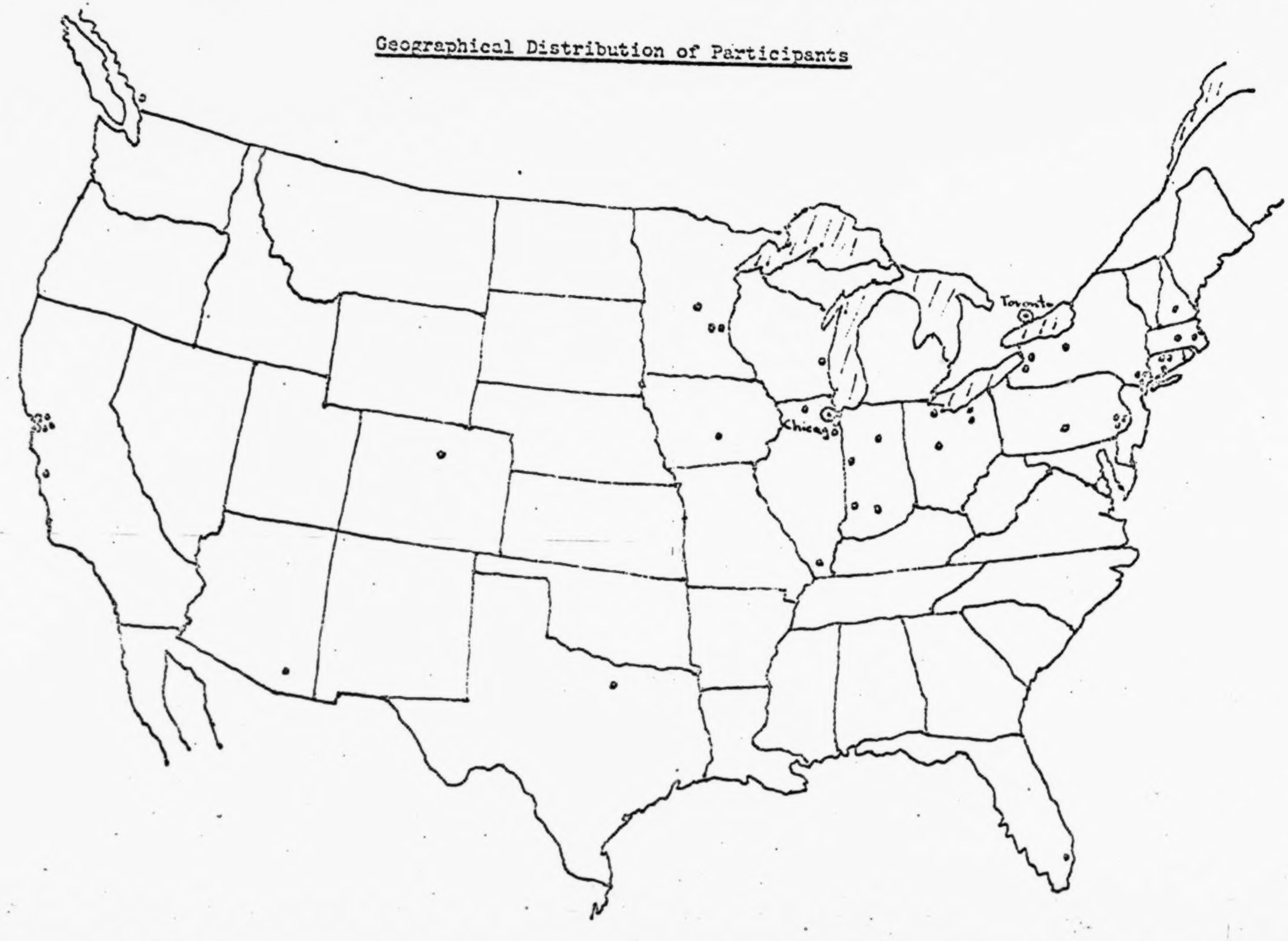
Presession Participants.

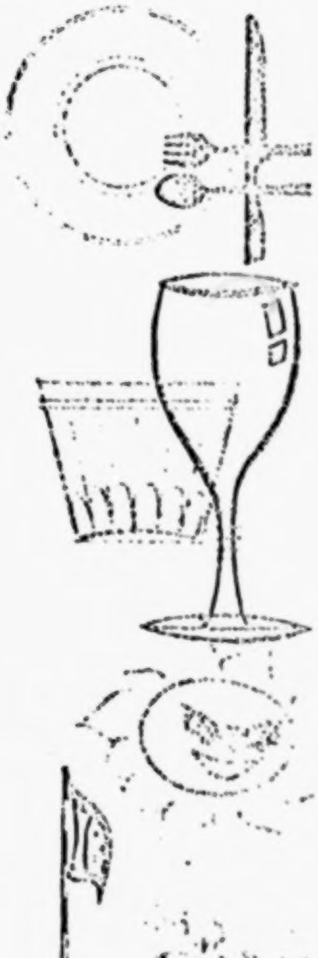
1. JOHN BELTON
   University of Wisconsin
2. GERALD BLUMENFELD
   Southern Illinois University
3. CHARLES BOYSEN
   Follett Publishing Co.,Chicago
4. PAUL BRANN
   Bucknell University
5. JASON BRUNK
   State University of New York
6. THOMAS CADWALLADER
   Indiana State University
7. EARLE CANFIELD
   Drake University
8. RUSSELL CHADBOURN
   University of Colorado
9. RICHARD ELDER
   Kent STate University
10. MALCOLM FLEMING
    Indiana University
11. IJOURIE FISHER
    Miami-Dade Jr. College
12. ALFRED HALL
    College of Wooster
13. DANIEL HEISEY
    University of New Hampshire
14. JACK HELLER
    University of Connecticut
15. GEORGE HICKROD
    Illinois State University
16. John Huntington
    Miami University, Ohio
17. PAUL INGWELL
    St. Cloud State College
18. MICHAEL JOSEPH
    Minneapolis Public Schools
19. SHAWKY KARAS
    Southern Connecticut State College
20. LUIGI LUCACCINI
    Dental Health Center, San Francisco
21. PETER MARTORELLA
    Temple University
22. DAVID MERRILL
    Stanford University
23. MATHEW MILES
    Teachers College, Columbia
24. JOHN MORRIS
    University of California at Berkeley
25. MADELINE MORRISSEY
    New York City Board of Education
26. GEORGE McCONKIE
    Cornell University
27. DOUGLAS McKIE
    University of British Columbia
28. THOMAS McLAIN
    Amphiteater Public Schools, Tucson
29. WILLIAM OLIVER
    Monterey County Office of Education
    California
30. ROBERT OWENS
    Brooklyn College, University of NY
31. DON PATTON
    Purdue University
32. EDGAR PERSONS
    University of Minnesota
33. MARK PFEIFFER
    La Salle College
34. JOSEPH RENZULLI
    University of Connecticut
35. MARTIN RYAN
    St. Joseph's College
36. JOSEPH SCANDURA
    University of Pennsylvania
37. SARITA SCHROCK
    Educational Research Council of
    America
38. NAIM SEFEIN
    State University of New York
39. BILLY TURNEY
    North Texas State University
40. LAWRENCE WIGHTMAN
    University of Massachusetts

Participant Information

Background					Expressed Interests						
Com. Expertise		Sel. Ed. History No. Of Courses			Primary Research				Application Areas		
Number of Courses	Level of Experience	Psychology and Sociology	Mathematics	Stat., Meas., Exp. Design	Administration and Economics	Curriculum & Instruction	Psychology or Sociology	Exp. Design and Analysis	Instruction	Research	Data Processing
1	1	12	2	9	-	*	-	-	*	*	*
-	-	12	6	7	-	-	*	-	*	*	-
						*	*		*	*	*
-	-	5	24	1	-	*	*	-	*	-	-
-	-	8	3	2	-	*	*	-	*	*	-
-	-	25	-	3	-	-	*	-	-	*	-
-	-	-	16	8	-	-	-	*	-	*	-
3	3	7	20	7	-	*	-	*	*	*	-
-	-	10	2	6	-	*	*	-	-	*	-
-	-	4	2	4	-	-	*	-	-	*	-
1	-	23	-	12	-	*	-	*	-	*	*
1	-	40	5	12	-	-	*	*	*	*	-
1	2	4	42	5	-	*	*	-	*	*	-
1	1	8	-	10	-	-	*	-	-	*	-
-	-	5	-	5	*	-	-	-	-	-	*
-	1	20	10	9	-	*	*	-	-	*	*
1	1	13	10	9	-	*	*	*	-	*	-
-	-	22	14	12	-	*	*	-	*	-	-
1	1	7	20	17	-	-	*	*	-	*	-
5	2	22	6	9	-	*	-	*	*	*	-
-	-	11	8	4	-	*	-	-	*	*	-
1	2	15	8	8	-	*	-	-	*	*	-
-	-	25	4	3	-	*	*	-	*	*	-
2	2	17	3	9	*	*	-	-	*	-	*
3	2	-	-	10	*	-	-	-	-	-	*
-	-	27	3	6	-	*	-	-	-	*	-
-	-	2	15	14	-	*	*	-	*	-	*
10	3	16	5	5	-	*	*	*	*	-	*
-	-	15	2	9	-	*	-	-	*	*	-
-	-	5	2	4	*	*	*	-	*	-	-
-	1	6	9	6	*	-	-	*	-	*	-
-	1	2	-	6	-	*	-	-	*	-	*
-	1	52	2	4	-	*	*	-	-	*	-
1	-	10	5	10	-	-	*	-	*	*	-
1	1	21	-	7	*	-	-	-	-	*	-
-	1	7	25	10	-	*	*	-	*	*	-
-	-	1	1	1	-	-	-	*	-	*	*
-	-	4	-	8	-	*	*	-	*	*	-
1	-	15	51	33	-	-	-	*	-	*	-
1	3	16	2	6	-	*	*	-	*	*	-

Geographical Distribution of Participants


Toronto
Chicago



☐ SUPPING

Delight your taste buds with one of the delicious specialties from each of the four distinctively different Pheasant Run restaurants. Try all four!

THE BAKER'S WIFE . . . famous for charcoal-broiled steaks, chops and roast pheasant, impeccably served in an Old English setting.

THE SMUGGLER'S COVE . . . exotic island dishes sreved with flare and flame in a robust pirate atmosphere. Try Drunken Lobster, Stake of Salem or Whyskey Chyken.

THE SCOTCH ON THE GREEN . . . enjoy breakfast, lunch or dinner in this bright and cheerful room overlooking the golf course. Try their thick juicy slabs of aged roast beef. Incomparable!

THE PEG AND PLANK . . . you'll find its warm, rustic colonial charm a perfect setting for a leisurely breakfast, a hearty lunch or a superb dinner served in a tradition of excellence.

☐ SIPPING

There are three "cocktail" lounges at Pheasant Run. Each is staffed with experienced "master mixers" . . . your assurance of a perfect cocktail — everytime. Lounges located in the Baker's Wife, Scotch on the Green and El Poco Toro on Bourbon Street.

☐ SWIMMING

It's fun for everyone in our unique indoor/outdoor pool. The water is always a pleasant 80°, inside and outside — in summer and winter.

☐ SUNNING

Sun lovers rejoice! — we never run out of sun at Pheasant Run. Three fully equipped sun decks! . . . and plenty of sun lamps indoors.

☐ SLICING

A golfer's paradise! Enjoy Pheasant Run's championship 18 hole course — with all the trimmings; rentals; carts (motorized and otherwise); lessons by resident pro and a complete pro shop.

☐ SAUNA

Here's a satisfying, stimulating way to spend a spare hour or two. Visit our complete health club! Saunas for men and women, exercise equipment, oxygen and massage by our expert masseur. (By appointment).

☐ SHOWS

For an evening that's tops in entertainment make your dinner/theater reservation at Pheasant Run playhouse. Always top name stars and the finest New York productions. Nightly except Monday. Two shows Saturday and matinee every Wednesday.

Children's Theater.
Children's classics are presented each Saturday at 2:00 p.m.
Reservations are necessary only for groups of 20 or more.
Children 75¢, Adults $1.00.

☐ SIGHTS & SOUNDS of Dixieland

One of America's top dixieland bands plays on Bourbon Street except Sunday. Dance if you wish — or just sit back and

APPENDIX #2.

TO: Applicants selected to participate in the On-line Computer Applications Presession

FROM: Ronald G. Ragsdale
Leslie D. McLean
Stacy Churchill
Maurice Constant

DATE: December 15, 1967

It is our pleasure to inform you that you are one of the persons invited to participate in the 1968 AERA presession, "On-line Computer Applications in Educational Research". It is hoped that you will accept our invitation and join us at Pheasant Run Lodge from February 3, 1968 through February 7, 1968.

If for any reason you find it impossible to attend the Presession, please telephone ((416) 923-6641, X445) or write immediately so that another applicant may have a chance to attend.

Participants should check into Pheasant Run Lodge (located near St. Charles, Illinois, about 35 miles from Chicago's loop) in the afternoon or evening of Friday, February 2, 1968. The Continental Air Transport Bus leaves from O'Hare Airport at 10:20 a.m. (not operating Sundays), 1:50 p.m., 4:40 p.m., 7:20 p.m. and 9:30 p.m. at the Eastern Airline lower level. The fare is $2.50 each way for a 40 minute trip. It will not be necessary for you to make your own reservations at Pheasant Run; you need only check in on February 2, 1968. Double rooms are $20.00 and single rooms are $16.00. All participants who do not indicate otherwise by January 8, 1968, will be assigned to double rooms randomly -- within sexes.

You may expect a final mailing in late January 1968 containing last-minute information and a more complete description of the facilities at Pheasant Run Lodge. If you have specific questions which could be answered at that time, or sooner, do not hesitate to write to us at 102 Bloor St. West, Toronto 5, Ontario Canada.

Thank you for your expression of interest in our Presession. We look forward to working with you.

APPENDIX B3

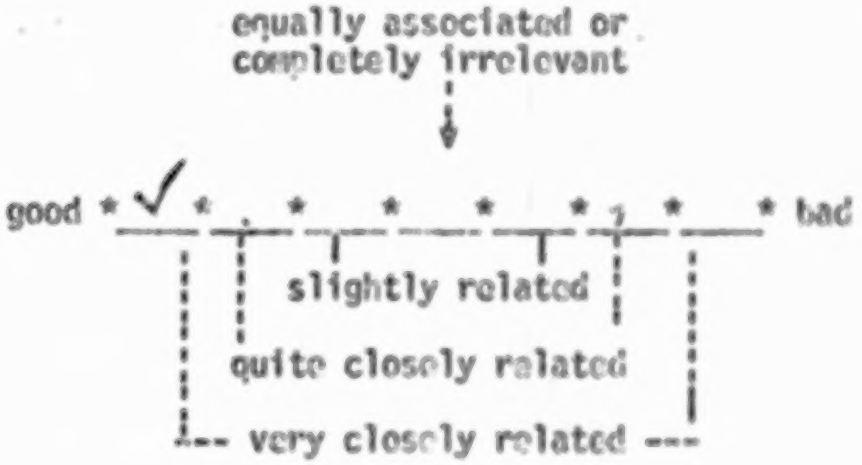
Instructions

The purpose of this study is to measure the meanings of certain things associated with computers in an educational setting. In taking the test, please make judgements on the basis of what these things mean to you in such a context.

On each page of this booklet, you will find a different concept to be judged at the top; beneath it a set of scales. You are to rate the concept on each of these scales in turn.

Place a check-mark between the asterisks at the appropriate point on the scale, depending on how you relate the scale to the concept.

For example:


equally associated or
completely irrelevant
good * ✓ * * * * * * * bad
slightly related
quite closely related
very closely related

Be sure to check every scale for every concept.

Important
1. Do not look back and forth through the pages.
2. Make each item a separate and independent judgement.
3. Work at a fairly high speed; it is your first impressions and immediate "feelings" about the items that we want. Do not worry or puzzle over individual items.

REMEMBER - EACH CONCEPT IS TO BE JUDGED FROM THE POINT OF VIEW OF COMPUTER APPLICATIONS TO EDUCATION.

Research

harmful *___*___*___*___*___*___*___* beneficial

simple *___*___*___*___*___*___*___* complex

valuable *___*___*___*___*___*___*___* worthless

optimistic *___*___*___*___*___*___*___* pessimistic

excitable *___*___*___*___*___*___*___* calm

changeable *___*___*___*___*___*___*___* stable

impotent *___*___*___*___*___*___*___* potent

tenacious *___*___*___*___*___*___*___* yielding

passive *___*___*___*___*___*___*___* active

divergent *___*___*___*___*___*___*___* convergent

intuitive *___*___*___*___*___*___*___* rational

untimely *___*___*___*___*___*___*___* timely

cautious *___*___*___*___*___*___*___* rash

lenient *___*___*___*___*___*___*___* severe

successful *___*___*___*___*___*___*___* unsuccessful

Communication

rash *___*___*___*___*___*___*___* cautious

optimistic *___*___*___*___*___*___*___* pessimistic

rational *___*___*___*___*___*___*___* intuitive

convergent *___*___*___*___*___*___*___* divergent

timely *___*___*___*___*___*___*___* untimely

passive *___*___*___*___*___*___*___* active

successful *___*___*___*___*___*___*___* unsuccessful

yielding *___*___*___*___*___*___*___* tenacious

lenient *___*___*___*___*___*___*___* severe

changeable *___*___*___*___*___*___*___* stable

impotent *___*___*___*___*___*___*___* potent

excitable *___*___*___*___*___*___*___* calm

worthless *___*___*___*___*___*___*___* valuable

harmful *___*___*___*___*___*___*___* beneficial

simple *___*___*___*___*___*___*___* complex

Experimentation

cautious*___*___*___*___*___*___*___* rash

active *___*___*___*___*___*___*___* passive

optimistic *___*___*___*___*___*___*___* pessimistic

impotent *___*___*___*___*___*___*___* potent

intuitive *___*___*___*___*___*___*___* rational

lenient *___*___*___*___*___*___*___* severe

untimely *___*___*___*___*___*___*___* timely

successful *___*___*___*___*___*___*___* unsuccessful

beneficial *___*___*___*___*___*___*___* harmful

divergent *___*___*___*___*___*___*___* convergent

calm *___*___*___*___*___*___*___* excitable

simple *___*___*___*___*___*___*___* complex

tenacious *___*___*___*___*___*___*___* yielding

changeable *___*___*___*___*___*___*___* stable

worthless *___*___*___*___*___*___*___* valuable

Hardware

optimistic *____*____*____*____*____*____*____* pessimistic

valuable *____*____*____*____*____*____*____* worthless

yielding *____*____*____*____*____*____*____* tenacious

unsuccessful *____*____*____*____*____*____*____* successful

intuitive *____*____*____*____*____*____*____* rational

rash *____*____*____*____*____*____*____* cautious

active *____*____*____*____*____*____*____* passive

potent *____*____*____*____*____*____*____* impotent

untimely *____*____*____*____*____*____*____* timely

stable *____*____*____*____*____*____*____* changeable

severe *____*____*____*____*____*____*____* lenient

calm *____*____*____*____*____*____*____* excitable

complex *____*____*____*____*____*____*____* simple

harmful *____*____*____*____*____*____*____* beneficial

convergent *____*____*____*____*____*____*____* divergent

Time-Sharing

calm *___*___*___*___*___*___*___* excitable

yielding *___*___*___*___*___*___*___* tenacious

harmful *___*___*___*___*___*___*___* beneficial

simple *___*___*___*___*___*___*___* complex

successful *___*___*___*___*___*___*___* unsuccessful

rational *___*___*___*___*___*___*___* intuitive

potent *___*___*___*___*___*___*___* impotent

active *___*___*___*___*___*___*___* passive

untimely *___*___*___*___*___*___*___* timely

severe *___*___*___*___*___*___*___* lenient

rash *___*___*___*___*___*___*___* cautious

valuable *___*___*___*___*___*___*___* worthless

changeable *___*___*___*___*___*___*___* stable

optimistic *___*___*___*___*___*___*___* pessimistic

convergent *___*___*___*___*___*___*___* divergent

Graphics

optimistic *____*____*____*____*____*____*____* pessimistic

active *____*____*____*____*____*____*____* passive

simple *____*____*____*____*____*____*____* complex

yielding *____*____*____*____*____*____*____* tenacious

changeable *____*____*____*____*____*____*____* stable

potent *____*____*____*____*____*____*____* impotent

successful *____*____*____*____*____*____*____* unsuccessful

beneficial *____*____*____*____*____*____*____* harmful

calm *____*____*____*____*____*____*____* excitable

convergent *____*____*____*____*____*____*____* divergent

worthless *____*____*____*____*____*____*____* valuable

untimely *____*____*____*____*____*____*____* timely

intuitive *____*____*____*____*____*____*____* rational

severe *____*____*____*____*____*____*____* lenient

cautious *____*____*____*____*____*____*____* rash

On-line

pessimistic *___*___*___*___*___*___*___* optimistic

excitable *___*___*___*___*___*___*___* calm

active *___*___*___*___*___*___*___* passive

severe *___*___*___*___*___*___*___* lenient

divergent *___*___*___*___*___*___*___* convergent

simple *___*___*___*___*___*___*___* complex

worthless *___*___*___*___*___*___*___* valuable

beneficial *___*___*___*___*___*___*___* harmful

intuitive *___*___*___*___*___*___*___* rational

unsuccessful *___*___*___*___*___*___*___* successful

impotent *___*___*___*___*___*___*___* potent

timely *___*___*___*___*___*___*___* untimely

stable *___*___*___*___*___*___*___* changeable

yielding *___*___*___*___*___*___*___* tenacious

rash *___*___*___*___*___*___*___* cautious

Instruction

stable *____*____*____*____*____*____*____* changeable

active *____*____*____*____*____*____*____* passive

untimely *____*____*____*____*____*____*____* timely

optimistic *____*____*____*____*____*____*____* pessimistic

rash *____*____*____*____*____*____*____* cautious

intuitive *____*____*____*____*____*____*____* rational

complex *____*____*____*____*____*____*____* simple

severe *____*____*____*____*____*____*____* lenient

calm *____*____*____*____*____*____*____* excitable

tenacious *____*____*____*____*____*____*____* yielding

beneficial *____*____*____*____*____*____*____* harmful

divergent *____*____*____*____*____*____*____* convergent

unsuccessful *____*____*____*____*____*____*____* successful

worthless *____*____*____*____*____*____*____* valuable

potent *____*____*____*____*____*____*____* impotent

Computer-Control

timely *___*___*___*___*___*___*___* untimely

calm *___*___*___*___*___*___*___* excitable

rational *___*___*___*___*___*___*___* intuitive

changeable *___*___*___*___*___*___*___* stable

worthless *___*___*___*___*___*___*___* valuable

harmful *___*___*___*___*___*___*___* beneficial

active *___*___*___*___*___*___*___* passive

severe *___*___*___*___*___*___*___* lenient

rash *___*___*___*___*___*___*___* cautious

optimistic *___*___*___*___*___*___*___* pessimistic

divergent *___*___*___*___*___*___*___* convergent

successful *___*___*___*___*___*___*___* unsuccessful

tenacious *___*___*___*___*___*___*___* yielding

simple *___*___*___*___*___*___*___* complex

potent *___*___*___*___*___*___*___* impotent

Man-Machine

passive *___*___*___*___*___*___*___* active

excitable *___*___*___*___*___*___*___* calm

tenacious *___*___*___*___*___*___*___* yielding

changeable *___*___*___*___*___*___*___* stable

optimistic *___*___*___*___*___*___*___* pessimistic

lenient *___*___*___*___*___*___*___* severe

valuable *___*___*___*___*___*___*___* worthless

rational *___*___*___*___*___*___*___* intuitive

rash *___*___*___*___*___*___*___* cautious

complex *___*___*___*___*___*___*___* simple

potent *___*___*___*___*___*___*___* impotent

harmful *___*___*___*___*___*___*___* beneficial

convergent *___*___*___*___*___*___*___* divergent

untimely *___*___*___*___*___*___*___* timely

unsuccessful *___*___*___*___*___*___*___* successful

Data-Analysis

beneficial *___*___*___*___*___*___*___* harmful

complex *___*___*___*___*___*___*___* simple

rash *___*___*___*___*___*___*___* cautious

active *___*___*___*___*___*___*___* passive

pessimistic *___*___*___*___*___*___*___* optimistic

unsuccessful *___*___*___*___*___*___*___* successful

intuitive *___*___*___*___*___*___*___* rational

severe *___*___*___*___*___*___*___* lenient

worthless *___*___*___*___*___*___*___* valuable

yielding *___*___*___*___*___*___*___* tenacious

calm *___*___*___*___*___*___*___* excitable

impotent *___*___*___*___*___*___*___* potent

stable *___*___*___*___*___*___*___* changeable

divergent *___*___*___*___*___*___*___* convergent

timely *___*___*___*___*___*___*___* untimely

Software

calm *___*___*___*___*___*___*___* excitable

unsuccessful *___*___*___*___*___*___*___* successful

changeable *___*___*___*___*___*___*___* stable

rash *___*___*___*___*___*___*___* cautious

beneficial *___*___*___*___*___*___*___* harmful

timely *___*___*___*___*___*___*___* untimely

pessimistic *___*___*___*___*___*___*___* optimistic

complex *___*___*___*___*___*___*___* simple

impotent *___*___*___*___*___*___*___* potent

yielding *___*___*___*___*___*___*___* tenacious

rational *___*___*___*___*___*___*___* intuitive

lenient *___*___*___*___*___*___*___* severe

convergent *___*___*___*___*___*___*___* divergent

active *___*___*___*___*___*___*___*passive

worthless *___*___*___*___*___*___*___* valuable

Computer

intuitive *___*___*___*___*___*___*___* rational

lenient *___*___*___*___*___*___*___* severe

convergent *___*___*___*___*___*___*___* divergent

worthless *___*___*___*___*___*___*___* valuable

yielding *___*___*___*___*___*___*___* tenacious

optimistic *___*___*___*___*___*___*___* pessimistic

untimely *___*___*___*___*___*___*___* timely

successful *___*___*___*___*___*___*___* unsuccessful

simple *___*___*___*___*___*___*___* complex

beneficial *___*___*___*___*___*___*___* harmful

calm *___*___*___*___*___*___*___* excitable

stable *___*___*___*___*___*___*___* changeable

impotent *___*___*___*___*___*___*___* potent

active *___*___*___*___*___*___*___* passive

rash *___*___*___*___*___*___*___* cautious

Simulation

potent *___*___*___*___*___*___*___* impotent

intuitive *___*___*___*___*___*___*___* rational

unsuccessful *___*___*___*___*___*___*___* successful

simple *___*___*___*___*___*___*___* complex

beneficial *___*___*___*___*___*___*___* harmful

untimely *___*___*___*___*___*___*___* timely

pessimistic *___*___*___*___*___*___*___* optimistic

severe *___*___*___*___*___*___*___* lenient

active *___*___*___*___*___*___*___* passive

valuable *___*___*___*___*___*___*___* worthless

rash *___*___*___*___*___*___*___* cautious

excitable *___*___*___*___*___*___*___* calm

tenacious *___*___*___*___*___*___*___* yielding

stable *___*___*___*___*___*___*___* changeable

divergent *___*___*___*___*___*___*___* convergent

Information System

tenacious *____*____*____*____*____*____*____* yielding

divergent *____*____*____*____*____*____*____* convergent

cautious *____*____*____*____*____*____*____* rash

optimistic *____*____*____*____*____*____*____* pessimistic

intuitive *____*____*____*____*____*____*____* rational

lenient *____*____*____*____*____*____*____* severe

changeable *____*____*____*____*____*____*____* stable

worthless *____*____*____*____*____*____*____* valuable

unsuccessful *____*____*____*____*____*____*____* successful

impotent *____*____*____*____*____*____*____* potent

beneficial*____*____*____*____*____*____*____* harmful

simple *____*____*____*____*____*____*____* complex

excitable *____*____*____*____*____*____*____* calm

active *____*____*____*____*____*____*____* passive

untimely *____*____*____*____*____*____*____* timely

APPENDIX #4

Formative Evaluation - 1

Actual Responses

To assist the staff in modifying the morning and afternoon sessions, your comments on the following would be appreciated.

Indicate your preference

Session Content

	Increase	Decrease	OK
1. Depth of Coverage	6	13	9
2. Breadth of Coverage	7	10	13
3. Theoretical Aspects	6	13	10
4. Practical Aspects	20		4
5. Volume		5	18

Session Format

	Increase	Decrease	OK
1. Allowed Questioning	5		24
2. Discussions	3	1	21
3. Formality	2	4	19
4. Group Size		6	19

Any other specific aspects you would like to see changed?

Group by proposal aspiration early/ Too much time spent on brain function of computer, not enough on immediate means of utilizing whatever available systems exist/ Increased emphasis on consumer application level/ Greater emphasis on implications for us as users of hardware and software/ Vocab. difficulty, end of session too late/ decrease use of undefined terms, decrease attempts at jokes/ Some examples of CAI/ Practical applications for users, discussion of available programs,contrast between batch and shared time utilization/ Check how many can program, know FORTRAN etc, constantly stree user implications and unite questions/Start seminar with slide film or movie/Practical applications of compute to research/More handouts/ Practical application of new concepts/Transparencies darker/.

Any special ones you wish retained?

Good, informal/ Visuals useful/ Overhead presentations are good/

APPENDIX #4

General

Impression that this is a very poorly planned presession ..... extremely disappointing to spend entire morning to gain what could have been described in 30.mins or put in a handout ..... not a very carefully sequenced building of ideas ,..... terms were not defined etc. ..... much I just don't understand ..... the whole thing has a short of lackadaisical attitude that makes me feel that this is going to be a lost 5 days ..... staff knows too much and tends to travel at own pace and level ..... can they slow down and exemplify points a bit more? ..... I am impressed by the desire of speakers to give something to everyone. At this point I feel I must wait. I am tired and have grown very weary of technical detail at times, but I respect highly the motives and "drive" of the staff. Just don't be offended if I occasionally need to shut my eyes ..... overview of how specific material being presented fits into one's general knowledge which will be required to use on-line equipment. In other words, was material nice background information or is it essential for me to know before I can program a task after selecting appropriate terminal hardware? ..... when or how does one find out what terminal equipment such as cathode ray tube, teletype, light pens, slide projectors, are available, what backup equipment is essential, what knowledge is essential before using? ..... AM and most of PM OK, began getting lost when GE system was being described, completely lost during IBM system description, no idea of what was being said.

APPENDIX #5

Formative Evaluation - 2

To assist the staff in modifying the evening sessions, your comments on how to make improvements are solicited.

Re: Films

Re: Terminal Activity

Re: Discussion Groups

General

Formative Evaluation - 2

Actual Responses.

Re: Films

OK ... films Sunday interesting, imaginary business info. dept. of interest ... no schedule of films ... too laymanish ... good ... add brief discussion period ... OK but not essential ... interesting diversion ... profited from them, no modification in scheduling ... many very good, should continue ... "Info. Ret" useful, other 2 time-killers ... good, illustrate better than most media, continue to use ... OK ... OK, but not highly appropriate ... satisfactory ... some info. on level & topics ... generally very interesting ... good ... good, more if possible ... good ... OK, list of films and distributors ... more if available ... describe during AM, PM sessions, two showing times good ... good.

Re: Terminal Activity

Not defined in my mind yet ... find ... open at night PLEASE and where is key? ... find, enjoyed, would like some time on WIZARD and Ford BASIC programs ... continued separation of group good ... seems adequately scheduled now .. . increase practice ... very useful ... one terminal hardly adequate, scheduling essential, make sure staff doesn't use time for own use ... good ... too crowded ... good ... sign-up time on terminal ... good ... ? ... more instructions on FOCAL or some other language ... good, when do we get two terminals? ... appropriate as scheduled ... OK ... good.

Re: Discussion Groups

Appointments might be appropriate, informal access more flexible ... small groups that are interested in similar topics, specificity of groups and topic planned in advance ... discussions and also main session get to the use of computers in research especially in analysis and control of experiments ... missed

APPENDIX #5

WIZARD group ... haven't been involved, make topics more specific and visible ... analysis of data group and FOCAL group ... list topics to determine if group members have mutual interests ... more definite topics, meeting places and discussion leader ... stop using slides, use BB ... which?... group with Les quite well done ... interested in design and analysis phase ... group extremely diverse, meager background, topics must be selected and announced, discussions need more structure ... haven't participated in any ... discussion of CAI or related programs planned or now in operation ... haven't been able to find one going on most of the time ... excellent if not over 8 in group, narrow topics, opportunity to schedule time with staff would be helpful, 15 min. blocks of time ... good ... not enough.

Re: General.

What are the role of "on-line use of computer techniques" in ed. research? ... after AM, PM sessions could we meet in small sections to discuss confusing points and issues? ... talk about proposals and funding ... going well in general ... "general" sessions fine ... sessions progressing well for my needs ... Sunday very good, better to use grouping to meet individual needs, enjoyed WIZARD ... 2nd day better than 1st, still too much wasted time, like suggestion for individual appointments ... not sure essential to work every evening ... would not various commercial firms be willing to provide items of equipment, AV accessories to illustrate random access procedures in action? ... not sure organized activities for evening necessary ... things are moving well, concepts coming around after time to digest them ... to run experiments, where do I begin where stimulus displays are presented via teletype, CRT or tapes, what are the economics, time practicalities, procedures in trying something like this? How large a staff needed? ... keep up the good work ... during all lectures, most technical (computer jargon, systems, software) references have been vague ... more study time needed, close down all operations except terminal for two hour block of time from 4-6 or end at 9 PM except terminal time ... good.

APPENDIX #6

AERA 1968 Research Training Presessions Program

Presession Critique for Staff Members
(For Directors, Instructors and Assistants)

Indicate your observation and judgment by checking each item in one column at the left. Items not applicable or not subject to your observation should be omitted. Be frank.

Commendable	Satisfactory	Unsatisfactory	
			1. Environmental conditions
3	3		a. Classroom spaces
1	3	2	b. Work spaces
	5	1	c. Living quarters
	4	2	d. Teaching equipment, aids (chalk boards, public address system, etc.)
	1	3	e. Resource material, library
	3	3	f. Eating facilities
			2. Participants
1	2	3	a. Appropriateness of academic backgrounds
1	3	2	b. Sufficiency of research experience
2	4		c. Willingness to work
2	4		d. Intellectual curiosity
3	3		e. Concern for applicability of techniques
2	4		f. Aspiration
	1	5	g. Immediate preparation for Presession
			3. Organization
	4	1	a. Adequacy of notice to prospective applicants
2	1	3	b. Sufficiency of preplanning
	4	2	c. Smoothness of operation
4	2		d. Adaptability to obstacles and feedback
4	2		e. Sensitivity to grievances
	4	1	f. Adequacy of financial support
			4. Schedule
1	4		a. Appropriateness of five days for the job
1	2	3	b. Time spent efficiently
	4	2	c. Events sequenced appropriately
	5	1	d. Punctuality
1	5		e. Balance between formal, informal affairs
3	3		f. Quantity of discussions
3	2	1	g. Quality of discussions
	4	1	h. Quality of formal presentations
2	1	1	i. Unobtrusiveness of evaluation efforts
1	3		j. Methods of evaluation
			5. Outcomes
1	4	1	a. Intended content was actually taught
3	3		b. Increase in participant understanding
	1	2	c. Improvement in attitude toward research
3	3		d. Personal associations initiated

(Over)

6. In general was the Presession well organized?

- Yes
- Could have been better -- a little tighter, pre-planned integration with "natural language" presession;
- Yes. It was loosely organized with the intention of achieving informality -- a goal which I feel was achieved; .
- Not as well as I would have liked it to be;
- Not at first as we did not realize the level of the participants until after the first day backgrounds were padded on questionnaire;
- No.

7. Were the facilities suitable for the activities which you had planned?

- No. Rooms too noisy, food too expensive;
- GE did not supply terminals in working order. Parlors were dark andaccess poor and uninviting;
- Work rooms should have been more pleasing;
- Yes;
- Physical OK. Needed two terminals to GE, had been promised two -- had only one;
- Yes;

8. Should Presessions be limited to the same hotel, or the same city, in which the annual meetings will be held?

- No;
- Yes;
- Yes;
- No!
- Not necessary -- better be away;
- No.

9. Were you to do the same assignment over, in what major ways, if any, would you change your contribution?

- Be more selective in choosing participants and parpare for homogeneous group;
- Plan a slide show explaining computer terminology;
- Structure it more highly;
- Yes -- I would have aimed toward the less theoretical, more practical informal presentations of which my own was the least appropriate for the audience;
- No major ways. With same sort of group I could now prepare a better handout and visuals;
- Make it more general, less jargon and rely on break-down into special interest group for achieving depth and understanding;
-

10. Do you wish that the Director had made firmer arrangements to assure participants and you of the staff opportunity to meet in pairs or small groups?

- No;
- Yes;
- Allowance for this was adequate!
- No. Personal contact was sufficient and 'firmer arrangements' would have reduced their utility.
- No -- this was well done;
- --

11 **Were the objectives you set for yourself during the Presession attained?**

- Yes;
- Yes -- though I hoped for more terminal time with participants;
- Yes'
- Yes -- in the majority of cases;
- Yes, except I wanted more user reaction to "Wizard";
- Mostly.

12. **Are you inclined to urge your colleagues to become staff members for such an institute or Presession?**

- Yes;
- Yes;
- Yes -- if they can articulate their area of knowledge;
- Yes;
- Definitely;
- Yes -- very much so.

13. **In what ways, if any, did you as a staff member benefit personally as a result of your participation in this Presession?**

- Contacts with people who have related problems or who indicate new applications of the fundamentals;
- a) learned about the subject -- as with all teaching, I learned by teaching;
  b) became much more aware of the state of the art throughout North America and of the needs of people in smaller schools;
  c) was able to get feedback as to the usefulness of OISE's FOCAL language, its hidden bugs, unclear parts of the manual, some new possibilities;
  d) was able to try out on-line data analysis ideas on a naive audience -- confirm fears, find some encouragement.
- a) greater understanding of the breadth & needs in the educational field;
  b) personal contacts
- The chief benefit was in meeting with researchers across the country -- on an individual or small group basis and discussing our mutual interests and concerns;
- Became aware of computer graphics and was able to test "Wizard" which is the pilot study for my thesis topic;
- Nil

Summary of Responses from 29 Participants   APPENDIX #7

AERA 1968 Research Training Presessions Program

Participant Evaluation Form

Directions: Please respond with a word, a phrase, or one or more sentences to as many of the following questions as you can. Your frank and honest evaluation can only benefit everyone concerned. Do not identify yourself by name unless you prefer to do so.

Environment and Facilities

1. a. To what extent did the relative unavailability of books and journals interfere with your attempts to master the content of this session?

Quite (2) Some (6) Little (6) No (15)

b. To what extent did reproduced materials given to you by the staff improve matters?
A lot (6) Considerable (10) Somewhat (8) More needed (3) Little (1)

2. a. Did you feel that you lacked a "place to work," either alone or in small groups?

Yes (2) Some (2) More "terminal" time (3) No (22)

b. Was your room satisfactory?

Yes (23) Average (1) Fair (1) Too expensive (6) No (1)

3. a. Which features of the meeting rooms were inadequate or not conducive to learning?
Poor AV Aids (3) Temp & Ventilation (4) Isolation (2) Scattered Rooms (3) None (14)

b. Which features were especially facilitative in the same regard?
Attractive (12) None (4)

Scheduling and Organization

4. a. Was five days too long a period to leave your work at home for the purpose of attending this session?

Yes (4) No (18) (Content of presession could have been done in 2 or 3 days (10)

b. Was five days too short a period in which to learn much of the content of this session?
Yes (4) No (16)

5. a. Were you allowed enough time in which to pursue activities of your own choosing?
Yes (14) Too much (3) No (11)

b. Would you have preferred not to meet in the evening after dinner?
Yes (9) No (10) No preference (10)

c. Would you have preferred more or fewer meetings per day than there actually were? Or was the number of meetings per day agreeable to you?

OK (21) More (1) Fewer (6)

6. a. Were the individual lectures too long to sit and listen or take notes?

OK (2) Some (4) No (22)

b. Were the lectures scheduled in an appropriate sequence?
Yes (16) OK (1) Sequence not apparent (9) No (3)

7. Did you have sufficient opportunities to interact with other participants?
Yes (19) No (9)

8. a. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention that you desired?
Yes (5) No (23)

b. Was it helpful to have graduate student assistants present?

Yes (27) Questionable (1) No (1)

9. Did the attempts to evaluate your progress and reactions during the session (and at this moment) interfere with your work here?

Yes (1)   Semantic Differential was irritating (4)   No (20)

10. In general, was the Presession well organized?

No (16)   Yes (8)   Problem Adapting to Ind. Differences (1)

Content and Presentation

11. a. Did the content of the lectures and readings presuppose far more previous training than you had?

Yes (8)   Occasionally (2)   No (19)

b. Should less training in these areas or more have been presupposed?

Less (5)   More (3)   OK (12)   Grouping of participants required (6)

12. To what extent was the content of the lectures and readings relevant to what you hoped to accomplish during the session?

Good (8)   Fair (8)   Very little (7)   Only specific ones (3)

13. a. Were the lecturers stimulating and interesting?

Yes (10)   Not very (6)   Only specific ones (13)   One only (3)

b. Were the lecturers competent to speak on the subject assigned them?

Yes (19)   Questionable (8)   Only specific ones (2)

c. Were the lecturers well prepared?

Yes (12)   No (4)   Questionable (8)   Only specific ones (9)

14. Were you disappointed in any way with the group of participants?

No (21)   At times (4)   Too heterogeneous (4)

Answer each of the following only by checking the more appropriate blank:

15. If you had it to do over again would you apply for this Presession which you have just completed?   Yes 15   No 14

16. If a presession such as this is held again would you recommend to others like you that they attend?   Yes 18   No 9   With reservations 2

17. Do you anticipate maintaining some sort of contact with at least one of the Presession staff?   Yes 14   No 14   Possibly 1

18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one?   Yes 24   No 1   Questionable 3

19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment?   Yes 2   No 27

20. Is it likely that you will collaborate in research with someone else attending this Presession (other than those you already were likely to collaborate with)?
Yes 7   No 22

21. Do you feel that the staff should feel that it has accomplished its objectives during this five-day presession?   Yes 10   No 10   Questionable 9

Comments:
- don't try to adapt to heterogeneity
- staff should receive high commendation for difficult task well done
- more emphasis should have been placed on CAI and curriculum
- poor terminal facilities, better organization required
- more direction for preparation for the presession
- more tightly-knit series of presentations, angry at low expectations of those presenting material

APPENDIX 18

February 15, 1968

Dear Participant:

The staff of the AERA Presession on "On Line Applications" would appreciate the completion and quick return of the form below to assist in efficient conclusion of the presession activities.

The bibliography and/or additional items will be sent to you on return of the form, and for those who have submitted a proposal, a second mailing will include comments of a staff member and suggested references concerning the proposal.

Please feel free to request any further information involving the application of on line computers to education.

Sincerely,

John G. Cornfield.

---

1. Please send [ ]
   do not send [ ] me the "Graphics" Bibliography.

2. I have participated in [ ]
   will submit to [ ] the 2nd administration of the Semantic Differential

3. I have completed [ ]
   will complete [ ] the final presession evaluation sheet
   do not wish to complete [ ]

4. My research proposal has been [ ]
   will be [ ] submitted for comments.
   will not be [ ]

Name: ______________________

Return to:

John G. Cornfield, Department of Computer Applications, OISE,
102 Bloor Street West, Toronto, Ontario.

PRESESSION X

THEORETICAL ISSUES AND RESEARCH PROBLEMS IN THE DEVELOPMENTAL PROCESSES OF COLLEGE STUDENTS

Director

Dr. Jonathan R. Warren
Educational Testing Service, Berkeley, California

INTRODUCTION

The presession on college student development differed from most of the other presessions, this year and previously, in being oriented more than has been customary toward the strategy of research instead of toward specifics of research techniques. Yet techniques were not neglected. In this case ways of handling data intended to represent changes in the subjects being studied were an important issue in the presession. But two other issues shared top billing with the methodological issue of change measurement.

Brief overviews of several theoretical positions on late adolescent development and selected results of studies of college students, usually atheoretical, were the two other focal points of the presession. The purpose, as stated in the descriptive statement published in Educational Researcher, was ". . . to integrate three themes -- (1) developmental theories associated with late adolescence and early adulthood, (2) recent longitudinal studies of college students, and (3) methodological issues in developmental research." Studies of late adolescent or college student development have seldom included attention to all three themes, and often studies are concerned with one theme to the exclusion of the others.

STAFF

Director

Jonathan R. Warren
Research Associate
Educational Testing Service
1947 Center Street
Berkeley, California 94707

Instructors

Gerald Gurin
Institute for Social Research
University of Michigan
Ann Arbor, Michigan 48106

Paul Heist
Center for Research & Development
in Higher Education
4606 Tolman Hall
University of California
Berkeley, California 94704

Assistants

Carolyn Hartsough
Dept. of Educational Psychology
University of California
Berkeley, California

Jill Morton
Center for Research & Development
in Higher Education
4606 Tolman Hall
University of California
Berkeley, California 94704

Carol Treanor
Center for Research & Development
in Higher Education
4606 Tolman Hall
University of California
Berkeley, California 94704

SEQUENCE OF EVENTS

Initial planning was only slightly disrupted by the burning in early January of Oakton Manor Resort Hotel, Lake Pewaukee, Wisconsin, where the presession had been scheduled to meet. Sam Lippert, of Conventions and Reservations, Inc., Chicago, who had initially made arrangements at Oakton Manor, arranged for a shift to The Abbey, Lake Geneva, Wisconsin, where two other presessions were also scheduled.

Transportation from O'Hare Airport was mildly inconvenient because of the distance and the season of the year. Some of the buses were unheated. With participants arriving at O'Hare at all hours during the day preceding the presession, reliance on chartered buses created problems for several participants who had not made plane connections because of weather problems. I recommend, therefore, that future presessions be held within reach of more convenient transportation, particularly in February in the parts of the country where winters can be severe. The distance is not as important by itself as the combination of distance, available transportation, and weather. In the Chicago area in February, I suggest staying within about 50 miles of Chicago.

The following schedule of events had been circulated to participants in early December:

Saturday, February 3

9:00 a.m. Session 1	Introduction Overview of content, procedures, expectations Definitions relevant to development Overview of problems in studying development
1:00 p.m. Session 2	Social psychological theories of development - I Treatment of nominal change data
8:00 p.m. Session 3	Problems on nominal change Discussion

Sunday, February 4

1:30 p.m. Session 4	Psychological theories of development - I Treatment of positional (scale) data - I
8:00 p.m. Session 5	Problems on positional change Discussion Critique of presession to this point

Monday, February 5

8:30 a.m. Session 6	Review if and where necessary Social psychological theories of development - II Michigan Study
1:30 p.m. Session 7	Psychological theories of development - II Study of Selected Institutions
8:00 p.m. Session 8	Discussion; speculation Projected research

Tuesday, February 6

8:30 a.m. Session 9	Treatment of positional change data - II Stanford-Berkeley Study
1:30 p.m. Session 10	Harvard Study Measurement of change in relationships (structural change)
8:00 p.m. Session 11	Problems on structural change Discussion, speculation, projected research

Wednesday, February 7

8:30 a.m. Session 12	Review and recapitulation Evaluation Post-test

The staff met at The Abbey through the afternoon on Friday, February 2, and modified the above schedule in the following ways.

(1) Treatment of nominal, or categorical, change data was shifted from Saturday, Sessions 2 and 3, to Monday morning, Session 6.

(2) Sanford's psychological theory of development was brought from Session 4 to Session 2, with social psychological theory.

(3) A problem in planning a study of college student development--the problem undertaken in 1956 by the Center for the Study of Higher Education as the Study of Selected Institutions (SSI)--was presented to the participants as a topic for group discussion Saturday evening, Session 3.

(4) A full discussion of the SSI study as it had been undertaken in actuality by the Center for the Study of Higher Education was brought from Session 7 to Session 4 on Sunday, to follow the group discussions of Saturday evening.

Psychological theory was presented in Session 4 as initially planned, but in relation to the outcomes of the SSI study.

Treatment of positional data was shifted from Session 4 and 5 on Sunday to Session 6 on Monday.

(5) Session 6 and part of Session 7 were planned for the methodological issues--treatment of nominal and positional change data--moved back from Sessions 2 and 4.

(6) Further discussion of social psychological theory and a report of the Michigan study were moved from Monday morning to afternoon--from Session 6 to 7--replacing the report of the SSI study, which had been moved up.

The remainder of the schedule was left as originally planned, but was modified in the following ways, as the presession progressed:

(1) All of Sessions 6 and 7 were given to lectures on methodological issues in measuring change--nominal, positional, and structural change--with social psychological issues and the Michigan study postponed to Session 9 Tuesday morning. This change was prompted by a judgment by the staff that the participants had been highly responsive to the Monday morning session on method, after chafing until then to get more explicitly into methodological issues, and that momentum would be maintained if Session 7 Monday afternoon continued with issues of method rather than shifting back to theory.

(2) Session 9, Tuesday morning, was therefore given to social psychological theory, the study of peer-group effects, and a report of the Michigan Study and to a report by David Whittaker, of the Center for Research and Development in Higher Education, on a study of student activists and the nonstudent fringe in Berkeley.

(3) Session 10, Tuesday afternoon, picked up the psychological theory postponed from Session 7, Monday afternoon.

The schedule, as it was actually carried out with the changes noted above was as follows, the changes through Session 6 resulting from the staff meeting Friday afternoon and the changes of Monday afternoon and Tuesday, Sessions 7 through 10, resulting from staff judgments made as the presession progressed.

Saturday, February 3

9:00 a.m. Session 1	Introduction of staff Overview of content, procedures, expectations Definitions relevant to development Overview of problems in studying development Pretest
1:30 p.m. Session 2	Sociological and social psychological approaches to research on development Social psychological theories of development
3:00 p.m.	Psychological developmental theory as represented by Nevitt Sanford Presentation of problem in research planning to be undertaken in the evening--the Study of Selected Institutions (SSI)
8:00 p.m. Session 3	Small group sessions to discuss SSI problem presented earlier

Sunday, February 4

1:00 p.m. Session 4	Critique of Saturday evening discussion Presentation of approach to the SSI study actually undertaken by Center for the Study of Higher Education
3:00 p.m.	Theoretical considerations in interpreting change
8:00 p.m. Session 5	Small group critiques of presession to this point General discussion of presession procedures

Monday, February 5

8:30 a.m. Session 6	Measurement of nominal (categorical) change; turnover indexes
9:30 a.m.	Measurement of positional (scale) change; assumptions of "true score" theory. Statistical significance of change in mean scores Effects of regression and homeostasis Illustrations from Stanford-Berkeley and Pomona data
1:30 p.m. Session 7	Comparisons of mean changes Errors in comparing groups of "changers" and "nonchangers" Estimating "true change" in individuals

3:00 p.m.	Effect of changing relationships among variables on measures of change Comparing relationships
7:30 p.m. Session 8	Group discussions

Tuesday, February 6

8:30 a.m. Session 9	Social psychological developmental theory Measurement of peer-group effects in the Michigan study
10:00 a.m.	Student activists and nonstudents as peer-group influences
1:30 p.m. Session 10	Problems of interpretation of change in SSI study
3:00 p.m.	Psychological theory--Sullivan and Erikson
7:30 p.m. Session 11	Group discussion

Wednesday, February 7

8:30 a.m. Session 12	Review and recapitulation; interpretation of various measures of change
10:00 a.m.	Post-test

Reference materials

The following reference materials were provided by staff members for use by the participants. While one or two copies of each would ordinarily be inadequate for a group of 40 people, the limited time available to the participants for reading alleviated the problem. Some of the materials, notably the Katz, Tucker, and Harris references, were in constant demand.

Harris, C.W. (Ed.) *Problems in measuring change*. Madison: Univ. Wisconsin Press, 1963.

Katz, J. (Ed.) *Growth and constraint in college students: a study of the varieties of psychological development*. Stanford, Calif.: Stanford University, 1967.

King, S.H. Early findings of the Harvard Study. (Mimeo).

Lord, F.M. The measurement of growth. *Educ. psychol. measmt.*, 1956, 16, 421-437.

Lord, F.M. Further problems in the measurement of growth. *Educ. psychol. measmt.*, 1958, 18, 437-451.

McNemar, Q. On growth measurement. *Educ. psychol. measmt.*, 1958, 18, 47-55.

Schaie, K.W. A general model for the study of developmental problems. *Psychol. Bull.*, 1965, 64, 92-107.

Tucker, L.R. Cluster analysis and the search for structure underlying individual differences in psychological phenomena. Dept. of Psychology, University of Illinois, 1967.

Tucker, L.R., Demarin, F. and Messick, S. A base-free measure of change. *Psychometrika*, 1966, 31, 457-473.

Stevenson, H.W. (Ed.) Concept of development. *Monogr. Soc. Res. Child Devel.*, 1966, 31 (Serial No. 107).

Vreeland, Rebecca S. Dating patterns of Harvard men. (Mimeo).

Handout Materials

1.	Study of Academic Impact and Environmental Press	2 pp.
2.	A Two-Plane Theory- Influences and Interactions	1 p.
3.	Questions in Measuring Change	1 p.
4.	Graph of Effect of N, r, and $^{S_2}/_{S_1}$ on Significance of Change	1 p.
5.	Comparing Groups with Respect to Change	1 p.
6.	Changes in Impulse Expression from Freshman to Senior Year	1 p.
7.	Further Issues in Measuring Change	1 p.
8.	Personality Change in Goddard Students	1 p.
9.	Problems in Measuring Change	1 p.
10.	Changes in Factor Pattern	3 pp.

PARTICIPANTS

Of the 40 participants, 15 were directors of institutional research or were staff members of research agencies or projects studying college students, 14 were faculty members in education or psychology, 9 were directors of college counseling centers or were college counselors, and 2 were deans of students. Almost all were involved in some way with current or planned studies of college students.

Represented by the participants were 19 state colleges or universities, 9 private colleges or universities, one junior college, and 5 educational associations or research agencies. They were scattered over 23 states and the District of Columbia, but the West and South were underrepresented. The North Central states had 11 representatives, the Northeastern states 10. The Plains States were represented by 5 participants, and the Southwest, West and Pacific Coast combined sent 7 participants. Kentucky, Tennessee, Maryland and the District of Columbia combined had 6 participants, but only one participant came from farther south than these. Thus, while the geographic spread was substantial, 32 of the 40 participants came from the North Central and Northeastern quadrant of the country or its fringe. The population of colleges is also relatively dense in this region of the country, but the desirability of regular, geographic shifts in locations seems clear.

The ages of the participants ranged from 25 to 60, with a median age of 35. The year in which the doctorate was awarded ranged from 1950 to 1968, with 1964 the median year. Of the 37 doctorates (3 participants had not received doctorates) 22 had been awarded in 1964 or later. Three participants were women.

PARTICIPANTS

Dr. Clarence Bagley
Director of Institutional Planning
SUNY at Cortland
Cortland, New York 13045

Dr. Larry Braskamp
Assistant Professor
Department of Educational Psychology
University of Nebraska
Lincoln, Nebraska 68508

Dr. C. Neal Davis
Dean of Students
Elmhurst College
Elmhurst, Illinois

Dr. Russell H. Brown
Associate Dean of Student Affairs
University of Nebraska
Lincoln, Nebraska 68508

Dr. Harry Canon
Director, Counseling Service
University of Nebraska
Lincoln, Nebraska 68508

Dr. William Hannah
Project on Student Development
Plainfield, Vermont 05602

Dr. Charles F. Elton
University of Kentucky
Lexington, Kentucky 40506

Dr. Thomas Frantz
Assistant Professor
State University of New York
Buffalo, New York 14214

Sister Barbara Geoghegan
Professor of Child Psychology
College of Mount St. Joseph
Mount St. Joseph, Ohio

Dr. Preston Graham
Counseling Division
El Centro College
Dallas, Texas 75202

Dr. John Gowan
Professor of Educational Psychology
San Fernando Valley State College
Northridge, California 91324

Dr. Claude Grant
Director, Office of Institutional
  Studies
University of Utah
Salt Lake City, Utah

Dr. William H. Grant
Direction, 1967-68 NDEA Institute
Michigan State University
East Lansing, Michigan 48823

Dr. Martin Haberman
Director of Teacher Education Programs
Central Atlantic Regional Educational
  Laboratory
1200 - 17th Street, N.W.
Washington, D.C. 20036

Mr. Isaiah Moyel
Director of Institutional Research
Columbus College
2735 Fernwood Avenue
Columbus, Georgia 31907

Dr. Edward F. Murray
Director of (Academic) Program
  Development and Research
Loretto Heights College
3001 South Federal Boulevard
Denver, Colorado

Dr. Jack Hutton
Educational Consultant
College of Dentistry
University of Kentucky
Lexington, Kentucky 40506

Dr. Arvo Juola
Professor of Evaluation Services
Michigan State University
East Lansing, Michigan

Dr. Howard C. Kramer
Dartmouth College
Hanover, New Hampshire

Dr. Leonard Kreisman
Director, Institutional Research
State University College
Oeonta, New York 13820

Dr. Carl Lindsay
Student Affairs Research
1109 Orange Building
The Pennsylvania State University
University Park, Pennsylvania 16802

Dr. Ronald L. Litherland
College Counselor
Moorhead State College
Fargo, North Dakota 58102

Dr. Eugene Lovelace
Assistant Professor of Psychology
University of Notre Dame
Notre Dame, Indiana 46556

Dr. Luther A. Marsh
Abilene Christian College
Abilene, Texas 79601

Dr. George Morgan
Assistant Professor of Psychology
Hiram College
Hiram, Ohio 44234

Dr. William E. Sedlacek
Counseling Center
University of Maryland
College Park, Maryland

Dr. Robert Shanky
Associate Professor
Saint Norbert College
West De Pere, Wisconsin 54178

Dr. Donald F. Nasca
Office of Research
State University College
Brockport, New York 14420

Dr. Harriett Rose
Director, University
  Counseling and Testing Center
University of Kentucky
Lexington, Kentucky 40506

Dr. Charles Rush
University of Pittsburgh
Pittsburgh, Pa. 15325

Dr. Donald Ruthenberg
Director of the Institutional
  Studies Program
Central States College Association
Illinois Wesleyan University
Bloomington, Illinois 61701

Dr. Robert Schiesel
Northern Illinois University
DeKalb, Illinois 60115

Dr. Harvy Schumer
Assistant Professor of Psychology
University of Massachusetts
Amherst, Massachusetts

Mr. John Steffen
Counseling Center
Kansas State University
Manhattan, Kansas 66502

Dr. Daniel Tanner
Professor of Education
Graduate School of Education
Rutgers, The State University
New Brunswick, N.J. 08903

Dr. Charles E. Werts
National Merit Scholarship Corporation
990 Grove
Evanston, Illinois

Dr. David N. E. Whittaker
Center for Research & Development
  in Higher Education
1947 Center Street
Berkeley, California

Dr. Donald Williams
University of Washington
15622 Lake Hills Boulevard
Bellevue, Washington 98004

Dr. Lucy Zaccaria
Coordinator of University Admission,
  Counseling, Placement, & Testing
  Programs
Student Counseling Service
University of Illinois
Chicago Circle - Box 4348
Chicago, Illinois 60680

Dr. Marcia D. Zwier
Associate Professor of Psychology
Middle Tennessee State University
Murfreesboro, Tennessee 37130

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EVALUATION

The major purpose of the presession was the integration of three somewhat disparate areas associated with college student development--theory, method, and data or accumulated evidence. While some simple problems were provided on the handouts to give the participants a brief experience with the use of particular equations and concepts, they were not intended for evaluation. Instead, in keeping with a major emphasis of the presession, an attempt was made to measure changes, over the 5 days of the presession, in the ways variables are organized or structured. The time and opportunities available to develop an instrument that would permit such an assessment were completely inadequate, but the attempt was considered desirable to illustrate two approaches to the assessment of change, one an important but neglected approach.

Descriptions of eight hypothetical studies were written that were intended to vary on two dimensions--good or bad in terms of criteria discussed in the presession, and theoretical versus atheoretical bases. The eight studies, listed below, were rated on 15 seven-point, bipolar scales, also listed below, in a semantic differential format.

Hypothetical Studies

A. To determine whether an increased incidence of social contact is associated with increased accuracy of self-perception, changes between freshman and sophomore years in self-reports of incidence of social contact were compared between students who had increased one standard deviation or more on a measure of accuracy of self-perception and those who had declined one standard deviation or more.

B. A hypothesized change between freshman and senior years in the relationships among estheticism, masculinity, and social extroversion was studied by comparing the freshman and senior year factor patterns of a set of measures that included measures of those variables for a sample of male liberal arts students.

C. The hypothesis that men increase more than women in esthetic interests while in college was tested by comparing the proportions of men and women who changed their responses to two questionnaire items on frequency of visits to art galleries and attendance at concerts between freshman and senior year.

D. The view that more men than women change their political preference during college was examined by comparing changes in statements of political preference among all the men and women respondents in a twenty-college study of value changes in college.

E. To investigate the effect of change in field of study on anxiety, students who had changed fields were compared with those who hadn't with respect to changes in anxiety scores between freshman and junior years.

F. Changes of male business major in self-reported frequency of dating were compared with those of male education majors to test the effect of non-social association with women on the dating frequency of men.

G. The incidence of change in residence between the sophomore and junior years was compared with the incidence of change between junior and senior years by examining the college records of place of residence for college classes, each in three successive years.

H. In a study of the relationship between change in autonomy and change in intellectuality, the correlation was computed between changes in autonomy scores and changes in intellectuality scores, independently of the initial scores of both, in a sample of fraternity men.

Rating Scales

Important-unimportant; exciting-unexciting; interesting-uninteresting; productive-unproductive; easy-difficult; complex-simple; familiar-unfamiliar; relevant-irrelevant; feasible-infeasible; theoretical-atheoretical; supported-unsupported; promising-unpromising; static-developmental; exploratory-confirmatory; sound-questionable.

The studies were intended to fall in the following quadrants of the two-dimensional space.

	Good	Bad
Theoretical	G, H	A, E
Atheoretical	B, F	C, D

Studies were considered "bad" when they were based on (1) comparisons of groups having high and low change scores (Study A), (2) measures that can be expected to have low reliability (Study C), (3) groups so large and diffuse that within-group variation makes interpretation questionable (Study D), and (4) changes across long periods of time in variables that can be expected to show extensive short-term variation (Study E). The four "good" studies had the opposite characteristics.

The "theoretical" studies were all based on an element of some developmental theory discussed in the presession. These "theoretical" elements were (1) the dependence of self-perceptions on social confirmation (Study A), (2) anxiety reduction, or cognitive balance, as a consequence of an act to change the setting, (Study E), (3) the shift from peer-dependence to self-dependence about the end of the junior year (Study G), and (4) the association between intellectuality and autonomy found in theories based on ego psychology (Study H). Although all four of these points were given some mention in the presession, the last two were not considered major issues and were discussed only incidentally.

The changes in perceptions hoped for--those that would indicate at least partial accomplishment of the presession's objectives--would show a mean shift in ratings of the "good" studies toward sound, promising, productive, and feasible; and of the "theoretical" studies toward theoretical, relevant, developmental, interesting, important, and promising. The other six adjective pairs were included to help mask what appeared to be obvious relationships among the ten adjective pairs intended to measure "goodness" and "theoretical relevance".

A second expectation was that the two "good, theoretical" studies and the two "bad, atheoretical" studies would move, from pretest to posttest, farther apart along the "good" semantic dimension, with the other four studies falling in between.

Third, the dimensionality of the semantic space was expected to change in ways that were not readily predictable, but that would involve clarification of the dimensions and perhaps a merging of the "good" and "theoretical" dimensions. This anticipated but unspecifiable shift in dimensionality was tested by comparing principal components analyses of the pretest and posttest ratings.

A fourth assessment of change consisted of multidimensional scaling of pretest and posttest ratings of similarity of all the 28 possible pairs of the 8 studies. If perceptions of research were changed during the presession, the changes seemed likely to be reflected in shifts in the ways the 8 studies would be perceived. Again, the nature of the changes was not specified in advance but was expected to show a shift from a rather poorly defined perceptual space to one more clearly defined. As of this writing, the multidimensional scaling analyses have not been completed.

Evaluation Results

The "good-bad" and "theoretical-atheoretical" dimensions did not appear in either the pretest or posttest semantic spaces. The pretest semantic space consisted of one major dimension and a second minor one; the posttest space consisted of one major dimension and two minor ones. Except for small variations in the minor dimensions, these patterns were stable across the 8 hypothetical studies.

In the pretest, the primary dimension was defined by exciting, important, relevant, promising, interesting, productive, and sound, and their polar opposites. The second dimension was defined by easy, simple, feasible, and atheoretical, and their polar opposites. These approximate the good-bad and theoretical-atheoretical dimensions intended, but the approximation is rough. Theoretical versus atheoretical, for example, was not expected to be associated with difficult-easy, complex-simple, and infeasible-feasible.

Some evidence of change in the desired direction is evident in the semantic space of the posttest. First, the factors are somewhat more stable across the 8 studies. The participants were more consistent at the end of the presession in the ways they used the 15 scales to describe the 8 studies than they were at the beginning. This is evident in the smaller number of scales that load on different factors when applied to different studies in the posttest as compared with the pretest.

Second, the posttest showed a greater tendency in the participants to use developmental and theoretical to describe studies perceived positively in other ways. The first factor in the posttest was defined by exciting, interesting, promising, productive, important, sound, relevant, developmental, and theoretical. A weak second factor was defined by easy and simple, and a weak third factor by familiar and feasible. On the posttest, 5 of 8 loadings of developmental and of theoretical on the first factor--the "good-bad" dimension were .60 or higher. On the pretest, 3 of 5 loadings were at that level for each of the two scales.

Changes in ratings of the 8 studies were examined for the 9 scales that defined the first factor in the posttest. Two of the 8 studies--study G, intended to be a good, theoretical study, and study B, intended to be a good, atheoretical study--showed shifts toward the "good" ends of 8 of the 9 scales and no changes on the ninth. Study H--the second good, theoretical study--shifted toward the "good" ends of 4 of the 9 scales, and did not change on the other 5. The second good, atheoretical study--Study F--showed changes on two of the scales, but in opposite directions.

Among the four studies intended to illustrate questionable research procedures, the changes were minimal and equivocal. Studies H and D each showed shifts toward the "bad" end on two of the nine scales. Study E showed a shift toward the "good" end on one scale. Study C showed shifts toward the "good" end on three scales and the "bad" end on one.

Some evidence of a shift in the participants' point of view toward research on college students in a direction advocated by the presession staff is apparent in the above changes. Shifts in ratings on 72 scales were examined. Forty-one scales showed no appreciable change. Of the 31 changes, 26 were toward a point of view advocated in the presession and 5 were in the opposite direction.

These results do not represent an adequate assessment of change, since reliabilities are unknown and are probably low, and correlation coefficients between pretest and posttest scales were not computed. Significance tests on the differences in mean scores were therefore not conducted. Further, even if statistically significant changes in the desired direction were found, the meaning of those changes could only be guessed at. Whether they represented anything more than learning the instructors' attitudes toward key words and phrases, such as "extreme groups" or "peer-group effects", is not determinable. Yet the illustration of two procedures for assessing changes in relationships among variables--changes in the factor structure of semantic differential scales and changes in the structure revealed by multidimensional scaling--seemed desirable in itself. The MDS results will be mailed to the participants when the analysis is completed.

RESULTS OF PARTICIPANTS EVALUATION FORM

1. a. To what extent did availability or unavailability of books interfere with mastery of content of presession?

None; the time available for reading was too limited to make reading material important	23
More handouts should have been available	5
Bibliography would have been desirable	5
Individual copies of papers would have been desirable	5

b. To what extent did reproduced materials given to you by the staff improve matters?

They were very helpful	17
Helpful	11
Mildly helpful	4
Needed more planning	1

2. a. Did you feel that you lacked a "place to work", either alone or in small groups?

Yes 3 No 33
Needed small rooms for small group meetings 1

b. Was your room satisfactory?

Yes 29 No 1
Control of heating was poor 8

3. a. Which features of the meeting room were inadequate or not conducive to learning?

No problems	20
Inadequate lighting	6
Inadequate heat control	6
Seating was too formal	4
Inadequate ventilation	3

b. Which features were facilitative?

No comment	21
Blackboard, pencils, paper, tables	7
Water	5
Isolation of room	4
Acoustics	2
Other	3

4. a. Was five days too long a period to leave your work at home for the purpose of attending this session?

Yes 7 No 24
3 or 4 days would be better 6

b. Was five days too short a period in which to learn much of the content of this session?

Yes 5 No 30
Prior preparation would have helped 1

5. a. Were you allowed enough time to pursue activities of your own choosing?

Yes 27 No 9

b. Would you have preferred not to meet in the evening after dinner?

Yes 6 No 23
Mixed feelings 4
Would have preferred one or two free evenings 3

c. Would you have preferred more or fewer meetings per day?

No 32
Would have preferred fewer meetings 2
Would have preferred more intensive meetings 2

6. a. Were the individual lectures too long to sit and listen or take notes?

Yes 6 No 27

b. Were the lectures scheduled in the appropriate sequence?

Yes 16 No 13
Should have started with more method 4
Should have started with more structure 3

7. Did you have sufficient opportunities to interact with other participants?

Yes 27 No 3 Equivocal 5

8. a. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention you desired?

Yes 2 No 32 Some were 2

b. Was it helpful to have graduate assistants present?

Yes 17 No 16 Equivocal 3

9. Did the attempts to evaluate your progress and reactions during the session (and at this moment) interfere with your work here?

Yes 2 No 32

10. In general, was the presession well organized?

Yes 16 No 12 Equivocal 8

11. a. Did the content of the lectures and readings presuppose far more previous training than you had?

Yes 3 No 32
Having materials beforehand would have helped 1

12. To what extent was the content of the lectures and the readings relevant to what you hoped to accomplish during the session?

Relevant	21
Slightly relevant	5
Equivocal	4
Irrelevant	2

13. a. Were the lecturers stimulating and interesting?

Yes 24 No 1 Equivocal 11

b. Were the lecturers competent to speak on the subject assigned them?

Yes 32 Some were 3

c. Were the lecturers well prepared?

Yes 25 No 6 Somewhat 2 Some were not 2

14. Were you disappointed in any way with the group of participants?

Yes 2 No 28 Some of them 5

15. If you had it to do over again would you apply for this presession?

Yes 32 No 3 Maybe 1

16. If a presession such as this is held again would you recommend to others like you that they attend?

Yes 32 No 3 Maybe 1

17. Do you anticipate maintaining some sort of contact with at least one of the presession staff?

Yes 33 No 1 Maybe 2

18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one?

Yes 36

19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment?

Yes 2 No 33 Maybe 1

20. Is it likely that you will collaborate in research with someone else attending this presession (other than those you were already likely to collaborate with)?

Yes 16 No 33 Maybe 7

21. Do you feel that the staff should feel it has accomplished its objectives?

Yes 31 No 3 Equivocal 2

RESULTS OF STAFF EVALUATION FORM

	Commendable	Satisfactory	Unsatisfactory
1. Environmental conditions			
a. Classroom spaces	4	2	
b. Work spaces	1	4	
c. Living quarters	3	3	
d. Teaching equipment, aids	1	5	
e. Resource material, library		2	2
f. Eating facilities	2	3	1
2. Participants			
a. Appropriateness of academic backgrounds	3	3	
b. Sufficiency of research experience	3	2	
c. Willingness to work	3	3	
d. Intellectual curiosity	4	2	
e. Concern for applicability of techniques	4	1	
f. Aspiration	3	2	
g. Immediate preparation	1	4	1
3. Organization			
a. Adequacy of notice to prospective staff	2	3	
b. Sufficiency of preplanning	1	4	
c. Smoothness of operation	1	4	1
d. Adaptability to obstacles and feedback	4	2	
e. Sensitivity to grievances	6		
f. Adequacy of financial support		5	
4. Schedule			
a. Appropriateness of five days	2	3	1

b. Time spent efficiently	2	4	
c. Events sequenced appropriately	1	4	1
d. Punctuality	3	3	
e. Balance between formal, informal affairs	2	4	
f. Quantity of discussions	2	4	
g. Quality of discussions	1	4	1
h. Quality of formal presentations	1	5	
i. Unobtrusiveness of evaluation efforts	3	3	
j. Methods of evaluation		5	

5. Outcomes

a. Intended content was actually taught	2	4
b. Increase in participant understanding	3	3
c. Improvement in attitude toward research	1	4
d. Personal associations initiated	3	3

6. In general was the presession well organized?

Yes 3 Qualified yes 3

7. Were the facilities suitable for the activities which you had planned?

Yes 6

8. Should presessions be limited to the same hotel, or the same city, in which the annual meetings will be held?

No 4

9. Were you to do the same assignment over, in what major ways, if any, would you change your contribution?

Better organization 3
Become better acquainted with participants 1

10. Do you wish the Director had made firmer arrangements to assure participants and staff opportunities to meet in pairs or small groups?

No 5

11. Were the objectives you set for yourself attained?

Yes 3 Qualified yes 3

12. Are you inclined to urge your colleagues to become staff members for such an institute or presession?

Yes 6

13. In what ways did you as a staff member benefit personally as a result of your participation in this presession?

Learned new material or methods	6
Met interesting people	1

COMMENTS

A question considered fairly intensively before, during, and after the presession was whether the intended scope--integration of theory, method, and data in a fairly broad area--was hopelessly unrealistic. My conclusion now, with some qualifications, is that it was not. I think this is true even though some points intended to be covered in each of the three areas were omitted. Although some of the major objectives were not well accomplished, I don't think the breadth of intended coverage was an obstacle.

None of the three areas was intended to be covered exhaustively, a point that should be obvious with a five-day session. Instead, selected material from each area was intended to be used to illustrate issues and problems that fall between or cut across the three areas. The dependence on some theoretical basis in interpreting change scores is one example. The selection of a change score according to some theoretical position is another.

The failure to accomplish the integrative goal of the presession, and the tendency to shift attention from one area to another without integrating them, are thought to have resulted more from a relative lack of specificity in the integrative portion of the presession than from an attempt to cover too broad an area. As the planning for the presession progressed, the points to be covered within each area were narrowed and sharpened. The same sharpening process, however, was not applied to the integrative aspects of the presession's goals, with the result that they got slighted. Nevertheless, useful exploration, in five days, of the points at which several broad areas impinge on each other does seem feasible and should continue to be part of the presession curriculum.

The usefulness of graduate assistants at the presessions was discussed at the meeting of the directors before the presessions. Their greatest usefulness is not at the presession, where one graduate assistant is probably sufficient, but in the months of prior planning. They are also highly valuable in preparing the report, although one is probably sufficient for that purpose too. In fact, the least adequately recompensed of the staff members were the graduate assistants. If the presessions are to offer more than condensed versions of standard graduate courses, which I think they should, a greater portion of the budget should be allocated to planning activities, and the most economical way to do this is to use graduate assistants.

With 5 of 6 staff members having to provide transportation from the West Coast, and with secretarial, telephone, postage, and duplicating costs occurring before the presession, the monetary advance was quite inadequate. Graduate students in particular are hard pressed to pay travel and maintenance expenses from their own funds, even though reimbursed later. Might not monthly reimbursement of expenses as they occur be possible, plus earlier reimbursement of the final costs?

In general, I think the money provided by the U.S. Office of Education to help support the presessions provides returns to educational research far out of proportion to its amount. I suspect, too, that the unreimbursed costs borne by the staff members' home institutions, and by the staff members themselves in time beyond that for which they are paid, are far greater than the reimbursed costs. Yet, as the item on the evaluation sheet asks, I would heartily encourage my colleagues to undertake such a presession. There are hidden values with the hidden costs.

PRESESSION XI

MULTIVARIATE DESIGN AND ANALYSIS
IN EDUCATIONAL RESEARCH

Director

Dr. Joe H. Ward, Jr.
Southwest Educational Development Laboratory

INTRODUCTION

When conducting an "evaluation," the simplest method would seem to be to select a method that has been successfully used in the past and then to use the established method with a minimum of change. The tendency to follow this strategy is even stronger when the "evaluators" have themselves used the previous methods. Further, from the feedback received concerning the 1967 report, one might feel justified in doing a repetition. However easy it is to duplicate a previous effort, the process is not as stimulating as was the original effort. Also, times are continually changing; situations are changing, and the status quo is the garrison for the timid.

Certainly, changes in the evaluation procedure would necessitate corresponding changes in a report. As might be expected, the 1968 presession was handled more smoothly concerning the evaluation at the presession than the 1967 presession. The reasons are obvious: the Multivariate presession was held for the first time in 1967, and the staff had an additional year to reflect on possible changes. Also, Dr. Gene Glass of the University of Colorado coordinated the entire presession's effort quite ably. In the past, each presession was more or less on its own with little coordination. Dr. Glass provided two evaluation forms (which are included in the appendix), one for the presession staff and one for the participants. For the 1967 evaluation report, an opinionaire was sent to participants, applicants who were not selected, and a random sample of Division D of the AERA. There seemed to be no point in duplicating that effort for the 1968 presession.

In the report of the 1967 presession (Report of the 1967 Presession On Multivariate Design and Analysis In Educational Research: An Evaluation), three articles appeared by members of the presession staff: "Objectives and Overview" by Joe H. Ward, Jr., "Generating Vectors for Regression Models at Object Time" by Earl Jennings, and "Assumptions Underlying the Fixed X Model" by Robert Bottenberg. In addition, Richard E. Schutz, Presession Director, had an article, "An Overview: Comments by the Presessions Director."

There seemed to be no real reason to duplicate these efforts *per se*. Instead, an article (Chapter II) was written by Joe H. Ward, Jr., "Director's Comments On 1968 AERA Presession Multivariate Design and Analysis in Educational Research." This was originally Dr. Ward's report to the Presessions Director. Chapter III was written by Dr. Samuel R. Houston, Institute for the Development of Educational Activities (IDEA), Los Angeles, which is supported in part by the Kettering Foundation. Dr. Houston was a participant in the 1967 presession and served as an assistant during the 1968 presession. The topic, "Some Educational Applications of the Fixed X Multiple Linear Regression Model," is mainly concerned with an application known as Judgment Analysis (JAN).

Chapter IV contains the presession schedule, along with the list of participants and the materials given out at the presession.

Chapter V contains the bulk of the evaluation, which centers around the forms filled out at the presession by the staff and participants.

Included are comments made by the participants about the various items. Also included are the data concerned with the background of the participants. Their backgrounds are contrasted, when possible, to the 1967 group.

The Appendix contains the various forms provided for the evaluation. In evaluating data, it is easy to become overly concerned with the process and subvert (somewhat) one's original intentions. In reality, a main objective continues throughout. The major question is: is the session, taken as a total, worth the effort? While a simple "yes" or "no" might be given, further questions naturally arise. How could the presession be improved? Who does the presession serve? Is there some other way, or time, that might be more profitable? These are but a few of the many questions which should be answered in some way about such a session.

An important portion of an evaluation is verbal feedback to the staff; data is an important part of evaluation, but the allowance for individual remarks by the participants, to the future participants, and to the staff would seem profitable. The participants were asked to comment on possible improvements in the presession. This question is pursued in more detail in the body of the report; however, some comments here seem appropriate. While the comments were open ended, fifteen of the forty-seven participants commented that it would be quite valuable to send a portion of the reading material before the presession (especially Dr. Bottenberg's and Dr. Ward's book). Several also commented on the possibility of offering a follow-up course, either in the summer time or at the AERA meeting itself. Another problem which presents itself is somewhat of a dilemma: the presession may be somewhat misleading regarding the name, Multivariate Design and Analysis in Educational Research. The content of the presession can be somewhat adequately described as Applied Multiple Linear Regression. The presession does not cover, as such, multivariate topics on the multivariate normal distribution, discriminant analysis, factor analysis, Hotelling's T^2 statistic, multivariate analysis of variance, or canonical correlation. If the planners of the AERA presessions wished to offer a course that included some of the preceeding topics, some difficulty might ensue with presession names and with the applicants attending the presession which fits their needs and expectations.

STAFF

Bottenberg, Robert
Air Force Personnel Research Laboratory
Box 1557
Lackland Air Force Base, Texas 78236

Jennings, Earl
Computer Assisted Instruction Laboratory
Sutton Hall
The University of Texas
Austin, Texas 78712

Houston, Samuel R.
Research Specialist
Institute for Development Activities
Suite 950
1100 Glendon Avenue
Los Angeles, California 90024

Koplyay, Janos B.
School of Education
Northwestern University
Evanston, Illinois

McGarvey, Miss Sheila
School of Education
Northwestern University
Evanston, Illinois

Schmid, John
Bureau of Research Services
Colorado State College
Greeley, Colorado 80631

Ward, Jr., Joe H.
Presession Director
Southwest Educational Development Laboratory
2416 Tower Life Building
San Antonio, Texas 78205

PARTICIPANTS

Aleamoni, Lawrence M.
University of Illinois
507 East Daniel
Champaign, Illinois 61820

Ashburn, Arnold G.
University of Southern
Mississippi
Box 437 Southern Station
Hattiesburg, Mississippi 39401

Baker, Charles D.
Counseling Center
Kansas State College
Pittsburg, Kansas

Blackwood, Ralph O.
College of Education
University of Akron
Akron, Ohio

Bridges, Jr., Charles M.
Foundations Department
Norman Hall
College of Education
University of Florida
Gainesville, Florida 32601

Brophy, Jere Edward
5801 S. Kenwood
University of Chicago
Chicago, Illinois 60637

Chuang, Ying Cheng
Mid-continent Regional
Educational Laboratory
104 East Independence Avenue
Kansas City, Missouri 64106

Cieslak, Paul J.
Project Sesame
Bucknell University
100 South Seventh Street
Lewisburg, Pennsylvania 17837

Cooper, James G.
University of New Mexico
7313 Gladden, N.E.
Albuquerque, New Mexico 87110

Cox, John A.
Counseling and Testing Center
University of Houston
Houston, Texas

Croft, John C.
Dept. of Ed. Administration
Ontario Institute for
Studies in Education
26 Welsford Gardens
Suite 404
Don Mills, Ontario
Canada

Cummiskey, Cletus J.
Mankato State
221 Lincoln Street
Mankato, Minnesota 56001

Donaldson, William S.
26-1 Copeley Hill
Charlottesville, Virginia 22903

Erickson, Harley E.
Department of Education
University of Northern Iowa
Cedar Falls, Iowa 50613

Forsyth, Robert A.
N103 East Hall
State University of Iowa
Iowa City, Iowa 52240

Frazier, William D.
Oklahoma State University
302 Gunderson Hall
Stillwater, Oklahoma 74074

Glick, Oren W.
Institute for Community Studies
2300 Holmes
Kansas City, Missouri 64108

Greenman, Renny
Washington Pre-College Testing Program
University of Washington
110 Lewis Annex
Seattle, Washington 98105

Hastings, Glen R.
University of Northern Iowa
Dept. of Education and
Educational Psychology
1204 Sunnyside Circle
Cedar Falls, Iowa 50613

Heimerl, Beatrice B.
Statistics, Meas. Research Dept.
Colorado State College
2023 9 Avenue
Greeley, Colorado 80631

Impellitteri, Joseph T.
Pennsylvania State University
248 Chambers Building
University Park, Pennsylvania 16802

Johnson, Richard T.
Stanford University
852 Ames
Palo Alto, California 94303

Klein, Alice E.
Rutgers University
10 Landing Lane
New Brunswick, New Jersey

Lemke, Elmer A.
403 Belview
Illinois State University
Dept. of Psychology
Normal, Illinois 61761

Linden, James D.
Psychology Department
Purdue University
Lafayette, Indiana

MacPherson, Eric D.
Faculty of Education
University of British Columbia
Vancouver 8, British Columbia
Canada

Marshall, Jon C.
School of Education
University of Missouri
St. Louis, Missouri 63121

Mouly, George J.
School of Education
University of Miami
Coral Gables, Florida 33124

Nagel, Elwyn H.
University of Iowa
2835 Brookside Drive
Iowa City, Iowa 552240

North, Willard E.
Central Missouri State College
800 North Holden
Warrensburg, Missouri

Pyatte, Jeff A.
Peabody Hall
University of Virginia
Charlottesville, Virginia

Pysh, Fred
Ontario Institute for
Studies in Education
Depart. of Computer Application
102 Bloor Street West
Toronto 4, Ontario
Canada

Rabinowitz, William
311 EPC II
Dept. of Educational
Psychology
Pennsylvania State University
University Park, Pennsylvania 16802

Rayder, Nicholas F.
Office of Evaluation Services
Michigan State University
East Lansing, Michigan 48823

Reid, J. Christopher
Acting Head
Instructional Media Research Unit
Purdue University
426 North Salisbury
West Lafayette, Indiana 47906

Reitz, William
371 Education Building
College of Education
Wayne State University
Detroit, Michigan 48202

Robertson, Dr. Alan G.
Director of Evaluation
Room 475
State Education Building Annex
Albany, New York 12224

Rofman, R. Lewis
Supervisor
Office of Research and Evaluation
School District of Philadelphia
7902 Pickering Street
Philadelphia, Pennsylvania 19150

Safrit, Margaret J.
8240 N. 46th Street
Milwaukee, Wisconsin 53223

Schurr, Kenton Terry
Office of Research
Ball State University
Muncie, Indiana 47304

Schulman, Lee S.
College of Education
Michigan State University
East Lansing, Michigan

Snider, Bill
East Hall
College of Education
University of Iowa
Iowa City, Iowa 52240

Streeter, Charles E.
Department of Education
Illinois State University
Normal, Illinois 61761

Theimer, Jr., William C.
Assistant Director
Research Division
Philadelphia Board of Education
21st. St. South of the Parkway
Philadelphia, Pennsylvania

Uhl, Norman P.
Director of Testing and Evaluation
Emory University
1106 Lullwater Road, N.E.
Atlanta, Georgia 30307

Van Mondfrans, Adrian P.
Purdue University
107 Russell Street
West Lafayette, Indiana 47906

Williams, Richard H.
School of Education
University of Miami
Coral Gables, Florida 33124

Yanis, Martin
3524 September Drive
Camp Hill, Pennsylvania 17011

PRESESSION SCHEDULE

As can be seen from the following schedule, the day of the participants was a full one indeed. Generally, the participants would arrive before 8:30 A.M. The first scheduled activity would be the laboratory period to help clear up the details of the input to the computer, and related activities. The participants would be busy with some presession activity from 8:30 A.M. to 9:00 P.M. To fully appreciate the value of the presession, some reading was probably pursued by at least some of the participants after 9:00 P.M.

Also included in this chapter are the list of materials distributed at the presession and the list of participants.

ACTUAL SCHEDULE FOR AERA 1968 PRESESSION IN MULTIVARIATE DESIGN AND ANALYSIS IN EDUCATIONAL RESEARCH

DAY 1 - SATURDAY, 3 FEBRUARY 1968

8:00 - 8:30 a.m.	Participants gather at Computing Center Room 168. Distribute book, list of participants, schedule, name tag.
8:30 - 10:00 a.m. (Ward)	Background and objectives. Research Analysis Lecture (RAL) Chapter 1 of "Applied Multiple Linear Regression
10:00 - 10:15 a.m.	Break
10:15 - 11:30 a.m. (Ward)	Research Analysis Lecture (RAL) Chapter 2 through Section 2.4, Mutually Exclusive Categorical Models.
11:30 - 12:00 a.m. (Jennings)	Research Analysis Lecture (RAL) Linear Dependence - definition and examples.
12:00 - 2:00 p.m.	Lunch and Laboratory (LAB), individual work.
2:00 - 2:45 p.m. (Bottenberg)	Research Analysis Lecture (RAL) Comparison of Assumed and Restricted Model. Computation of the F-Statistic.
2:45 - 3:30 p.m. (Jennings)	Computer Analysis Lecture (CAL)
3:30 - 3:45 p.m.	Break
3:45 - 5:30 p.m. (Jennings)	Computer Analysis Lecture (CAL) Discussion of 3 Services Card Deck and Output. Input 3 Services Problem with DATRAN at 5:30 p.m. Distribute Problem Set 1. Completed Problems in by 9:00 p.m.
7:00 - 9:00 p.m.	Laboratory (LAB) - Participants and staff work together as needed on individual basis.

DAY 2 - SUNDAY, 4 FEBRUARY 1968

8:30 - 9:00 a.m.	Laboratory (LAB) - Participants receive computer output and make corrections.
9:00 - 10:00 a.m.	Continued on Mutually Exclusive Categories
10:00 - 10:30 a.m. (Ward)	RAL - Problems in Ordering and Linearity Mutually Exclusive Categorical Models.
10:30 - 10:45 a.m.	Break
10:45 - 12:15 a.m. (Jennings)	CAL - Preparation of Computer Input for Problems in Ordering and Linearity. Input computer deck by 12:00 noon.
12:15 - 2:00 p.m.	Computer Runs on decks to test linearity.
12:00 - 2:00 p.m	Lunch and LAB.
2:00 - 2:30 p.m.	Ward - Summarized Morning - Jennings - went over output
2:30 - 3:30 p.m. (Bottenberg)	RAL - Assumptions of General Linear Model
3:30 - 3:45 p.m.	Break
3:45 - 5:30 p.m. (Bottenberg)	RAL - Assumptions of General Linear Model Distribute Problem Sets 2 and 3
7:00 - 9:00 p.m.	LAB. Worked on Problem sets.

DAY 3 - MONDAY, 5 FEBRUARY 1968

8:30 - 9:00 a.m.	LAB
9:00 - 10:30 a.m. (Ward)	RAL - Extensions of 1 - Attribute Problem
10:30 - 10:45 a.m.	Break
10:45 - 12:00 a.m. (Ward)	RAL - 2 Attribute Problem
12:00 - 2:00 p.m.	Lunch and LAB
2:00 - 4:15 p.m.	LAB. Individual work - 2-way analysis Prepare own models, F-cards, etc.
4:15 - 5:30 p.m. (Ward)	Further variations on the 2-way analysis
7:00 - 9:00 p.m.	LAB
NOTE: 7:00 - 9:00 p.m. (Ward)	There will be a special session for those interested in the computational aspects. TOPIC: Computer Subroutine Systems - A discussion of the PERSUB system.

DAY 4 - TUESDAY, 6 FEBRUARY 1968

8:30 - 9:00 a.m.	LAB
9:00 - 10:30 a.m. (Ward)	RAL Covariance Analysis
10:30 - 10:45 a.m.	Break
11:00 - 12:00 a.m. (Ward)	Covariance Analysis
12:00 - 2:00 p.m.	Lunch and LAB
2:00 - 2:45 p.m.	LAB - Covariance Analysis
2:45 - 3:30 p.m. (Bottenberg)	3 - Factor Interaction
3:30 - 3:45 p.m.	Break
4:00 - 4:15 p.m. (Ward)	RAL - Continue on Covariance Analysis (variations)

4:30 - 5:30 p.m. (Ward)	RAL - 2 attribute Problem - Linearity assured in both attributes
7:00 - 9:00 p.m.	LAB
NOTE: 7:00 - 8:00 p.m. (Ward)	There will be a special session for those interested in the computational aspects. **TOPIC**: The Iterative Regression Program used in the PERSUB system.

DAY 5 - WEDNESDAY, 7 FEBRUARY 1968

8:30 - 9:00 a.m.	LAB
9:00 - 10:30 a.m. (Ward)	RAL - F-Statistic, Orthogonal Decomposition and Least Squares Computation
10:30 - 10:45 a.m.	Break
10:45 - 12:00 a.m. (Ward)	RAL - Additional Application of Regression Models
12:00 - 2:30 p.m.	Lunch and LAB
2:30 - 3:30 p.m.	RAL
3:30 - 3:45 p.m.	Break
3:45 - 4:30 p.m.	Final Summary, Evaluation

MATERIALS DISTRIBUTED

Feb. 3

1. TDR -63-6-APP. MLR- Bottenberg and Ward -AD 413 128 - Available from Clearinghouse for Fed. Sci. Info.; 5285 Port Royal Road; Springfield, Va. 22151
2. Schedule
3. List of Participants and Staff
4. Objectives and Overview - Ward
5. Examples of Linear Independence and Dependence
6. Job Deck Preparation
7. 3 Services with Datran - Print-out
8. Datran Explanation Sheet
9. Flow chart of a Program - Jennings
10. Problem Set 1
11. PERSUB Deck with 3 Services Problem

Feb. 4

12. PERS. Res. Lab Publications - Bottenberg
13. Set of data deck
14. Non-Linearity Control Cards
15. Revised List of Participants
16. Non-Linearity - Output (Print)
17. Problem Set 2
18. Problem Set 3

Feb. 5

19. Flow Chart - Ward
20. Assumptions Underlying Fixed X Model
21. Use of Unit Vector - Bottenberg
22. Assumptions for Multiple Lin. Reg. Model
23. Fixed Effects Anova by Regression Anal - Jennings
24. Control Cards for 2 x 3 Model

Feb. 6
25. Main Program A.E.R.A. (Xerox Copy)
26. An Iterative Technique - Ward
27. Control Cards for Edwards Covariance
28. Control Cards for 2 Predictor Problem

Feb. 7
29. The Computation of F Statistics - Ward
30. Synthesizing Regression Models - Ward
31. Orthogonal Decomposition - Ward
32. Topics Related to the Computational Aspects - Ward
33. Control Cards for Quadratic Covariance

EVALUATION RESULTS

Procedure

The evaluation has basically two sources of data, the application form and the evaluations made immediately following the presession. The application data should be useful in determining who attended the presession. Also, whenever possible, contrasts will be drawn between the 1967 participants and the 1968 participants. In that the format of the application form has changed appreciably, this is not always possible.

In the 1967 report contrasts were made between those who were selected and those who were not selected. This does not seem to be as relevant with the 1968 group. In 1967, 43 of the 88 applicants were selected and attended. In 1968, 60 individuals were selected out of 78 applications. The discrepancy in size between the selected group and non-selected group would not be as meaningful as before.

Characteristics of Participants (Both 1967 and 1968)

Because of the differences between the application forms, comparisons between the 1967 and 1968 participants can be made on the first six variables only.

	Sex	
	Male	Female
1967 Group	41	2
1968 Group	47	3

			Age				
	Omit	20-29	30-39	40-49	50+	Mean	S.D.
1967 Group	1	10	18	14	0	36.19	4.19
1968 Group	1	13	17	15	4	37.91	4.96

	Per Cent of Time In Research							
	0	1-24	25-29	50-74	75-99	100	Mean	S.D.
1967 Group	3	3	10	11	8	8	60.33	19.47
1968 Group	6	8	11	12	3	10	49.00	23.39

	Attainment of the Doctorate	
	Have Doctorate	Do Not Have Doctorate
1967 Group	37	6
1968 Group	46	4

	Number of Research Articles							
	0	1	2-5	6-10	11-20	21-40	Mean	S.D.
1967 Group	13	8	14	2	4	2	4.12	7.10
1968 Group	5	2	16	14	9	4	8.34	7.75

	Number of Funded Research Activities						
	0	1	2	3-9	10-up	Mean	S.D.
1967 Group	27	8	6	2	0	.63	.98
1968 Group	28	8	9	4	1	1.18	2.10

In comparing the two groups, it can be seen that the ratio of male participants is essentially the same. A few more of the 1968 group have attained the doctorate. The 1967 group is slightly younger, though this difference is nonsignificant ($p > .05$). The 1967 group spent significantly more time in research, 60.33% to 49% ($p < .05$). The 1968 group has a significantly larger number of research articles ($p < .01$) and a slightly, though nonsignificant, larger number of research activities ($p > .05$) than the 1967 group. One might be inclined to view the two differences (per cent of time in research and number of research articles) as being real differences between the two groups. Several other possibilities may be present. Concerning per cent of time in research, for example, there might have been a larger emphasis on several individuals being in a research capacity, and a slight change could have occurred to allow more people to spend time in research and reduce somewhat the amount a given individual spent in research. Also, people might have planned ahead so that they might squeeze the presession into their tight teaching schedule. Many other possible explanations might ensue.

Concerning the differences in number of research articles, there is a very difficult problem of semantics. On the 1967 application form, the question "How many research articles which you have authored alone or jointly have been accepted in a scholarly (refereed) journal?" The same question appeared in the 1968 application form. However, on the 1968 form, this question was followed by, "In total, how many research articles, theses, or technical reports (both published and unpublished) have you authored alone or jointly?"

Perhaps becuase of the ambiguity that these two questions might have caused, only about half of the participants answered the first question (a mean of 2.94 would be found using the results of the first question, which was identical to the 1967 question) and it would seem best to make no judgments about differences between the two groups on this question. It also points up the suggestion that either the future application forms be further revised or the directions for filling them out be given in more detail.

Characteristics of Participants

(1968 Group Only)

Coursework in Educational Measurement or Psychometrics

None	1-4	5-9	10-14	15-19	20-24	25-29	Mean	S.D.
0	33	8	4	2	2	1	5.30	6.16

Coursework in Electronic Computers

None	1-4	5-9	10-14	15-19	20-24	Mean	S.D.
23	26	0	0	0	1	2.00	3.06

Coursework in Mathematics (excluding math education)

None	1-4	5-9	10-14	15-19	70	Mean	S.D.
6	20	12	9	2	1	6.00	9.75

Coursework in Statistics and Experimental Design

None	1-4	5-9	10-14	15-19	20-24	25-29	Mean	S.D.
0	34	10	4	0	1	1	4.70	5.10

Use of Computer

Yes	No
42	8

Coursework in Anthropology

None	1-4	5-9	Mean	S.D.
35	14	1	.50	.99

Coursework in Curriculum

None	1-4	5-9	10-14	Mean	S.D.
11	33	4	2	2.38	2.35

Coursework in Educational Administration

None	1-4	5-9	10-14	15-19	20-24	25-29	Mean	S.D.
18	23	5	2	0	0	2	3.02	5.61

Coursework in Linguistics

None	1-4	5-9	10-14	Mean	S.D.
44	5	0	1	.38	1.74

Coursework in Psychology

None	1-4	5-9	10-14	15-19	20-24	25-29	30-39	70	Mean	S.D.
2	10	11	5	11	2	2	5	2	14.58	14.62

Coursework in Sociology					
None	1-4	5-9	10-14	Mean	S.D.
14	27	7	2	2.48	2.84

MAJOR FIELD OF STUDY FOR LAST DEGREE

Curriculum	5
Education-Engineering	1
Physical Education	1
Educational Administration	3
Speech	1
Psychology (including educational psychology, social psychology, guidance, etc.)	26
Mathematics Education	1
Higher Education	1
Educational Measurement and Research (including statistics)	11

Geographical Distribution of Participants

(The numbers following the states refer to the number of participants from that state)

East Coast

New Jersey - 1

New York - 2

Pennsylvania - 6

Ohio - 2

West Coast

California - 1

Midwest

Illinois - 4

Iowa - 5

Indiana - 4

Kansas - 1

Michigan - 3

Minnesota - 1

Missouri - 4

Oklahoma - 1

Wisconsin - 1

South

Florida - 3

Georgia - 1

Virginia - 2

Mississsippi - 1

Northwest

Washington - 1

Canada - 3

Southwest

New Mexico - 1

Texas - 1

Mountain States

Colorado - 1

Intuitively, one might hazard a guess that a majority of the participants had an extensive background in the quantitative areas. The quantitative areas would be reflected by coursework in Educational Measurement or Psychometrics, Electronic Computers, Mathematics, and Statistics and Experimental Design. It might come as a surprise that without question, the largest amount of coursework is in the area of psychology (a mean of 14.58 courses), with the second largest amount of coursework in mathematics (a mean of 6.00 courses). Following in order are coursework in educational measurement or psychometrics (a mean of 5.30 courses); statistics and experimental design (a mean of 4.70 courses); educational administration (a mean of 3.02 courses); sociology (a mean of 2.84 courses); curriculum (a mean of 2.38 courses); electronic computers (a mean of 2.00 courses); anthropology (a mean of .50 courses); and linguistics (a mean of .38 courses).

In that 26 of the 50 participants were majors in some phase of psychology, this result may seem hardly surprising. If the eleven majors in educational measurement and research are considered as a group, they have approximately ten courses each in psychology, mathematics, and statistics, with eight courses in educational measurement and psychometric (all are means). Incidentally, as a group, they have a mean of 1.00 courses in electronic computers.

If a cutoff is made (arbitrarily) at five or more courses, the following distribution is found:

Five or More Courses in:

Psychology 38
Mathematics 24
Educational Measurement and Psychometrics 17
Statistics and Experimental Design 16
Educational Administration 9
Sociology 9
Curriculum 6
Electronic Computers 1
Anthropology 1
Linguistics 1

While 42 of the 50 individuals had used the computer, it would seem evident that the use was as a *user* rather than as a programmer (although several of the participants are in fact programming).

In summary, the background of the participants can best be termed as being in the area of educational psychology, with an emphasis in the quantitative areas. In light of the fact that 26 are majors in some area of psychology (22 are also members of the American Psychological Association, three of these members *not* having a stated major in the area of psychology), a wider consideration of this background would seem in order.

PRESESSION CRITIQUE FOR STAFF MEMBERS

The presession staff was given the opportunity to make some judgments concerning the presession. They are as follows:

Indicate your observations and judgment by checking each item in one column at the left. Items not applicable or not subject to your observation should be omitted. Be frank.

Commendable	Satisfac.	Unsatisfac	
			1. Environmental conditions
4	1	1	a. Classroom spaces
2	2	1	b. Work spaces
3	2	0	c. Living quarters
3	3	0	d. Teaching equipment, aids(chalk boards, public address system, etc.)
2	3	0	e. Resource material, library
3	3	0	f. Eating facilities
			2. Participants
1	5	0	a. Appropriateness of academic backgrounds
0	5	0	b. Sufficiency of research experience
5	1	0	c. Willingness to work
4	2	0	d. Intellectual curiosity
4	2	0	e. Concern for applicability of techniques
3	2	0	f. Aspiration
0	6	0	g. Immediate preparation for Presession
			3. Organization
5	0	0	a. Adequacy of notice to prospective applicants
5	1	0	b. Sufficiency of preplanning
3	3	0	c. Smoothness of operation
3	2	0	d. Adaptability to financial support
			4. Schedule
2	4	0	a. Appropriateness of five days for the job
3	3	0	b. Time spent efficiently
5	1	0	c. Events sequenced appropriately
5	1	0	d. Punctuality
2	4	0	e. Balance between formal, informal affairs
4	2	0	f. Quantity of discussions
4	2	0	g. Quality of discussions
4	2	0	h. Quality of formal presentations
3	3	0	i. Unobtrusiveness of evaluation efforts
1	5	0	j. Methods of evaluation
			5. Outcomes
6	0	0	a. Intended content was actually taught
6	0	0	b. Increase in participant understanding
5	1	0	c. Improvement in attitude toward research
3	3	0	d. Personal associations initiated

6. In general was the Presession well organized?

Yes	6
No	0

7. Were the facilities suitable for the activities which you had planned? If not, specify.
    - Yes 5
    - Qualified 1; need a few more conference rooms for small group discussion
8. Should Presessions be limited to the same hotel, or the same city, in which the annual meetings will be held?
    - Same city 1
    - No 5
9. Were you to do the same assignment over, in what major ways, if any, would you change your contribution?
    - More handout materials 2
    - More "fixed" evening topics 1
    - More small group discussion 1
10. Do you wish that the Director had made firmer assignments to assure participants and you of the staff opportunity to meet in pairs or small groups?
    - Yes 3 (Those who said "yes" recognized the difficulty of doing so)
    - No 3
11. Were the objectives you set for yourself during the Presession attained?
    - Yes 5
    - Not quite 1; would prefer to interact with small groups more
12. Are you inclined to urge your colleagues to become staff members for such an institute or Presession?
    - Yes 6
    - No 0
13. In what ways, if any, did you as a staff member benefit personally as a result of your participation in this Presession?
    - Interaction with colleagues
    - Reward of effort
    - Challenge of task
    - Learning experience
    - Personal satisfaction
    - Exposure to new variety of research questions
    - Professional contacts
    - Increased enthusiasm for my work

PARTICIPANT EVALUATION

Immediately after the presession had been completed, the participants filled out an evaluation form. The questions are repeated here with totals on each question and in several cases, typical comments.

Environment and Facilities

1. a. To what extent did the relative availability of books and journals interfere with or promote your attempts to master the content of this session?

Favorable response	20
Unfavorable response	15
Neutral response	9
Did not respond	3

b. To what extent did reproduced materials given to you by the staff improve matters?

Favorable response	45
Unfavorable response	1
Neutral response	0
Did not respond	1

"Materials were fine but most should have been given in advance."
"Excellent - a course highlight!"

2. a. Did you feel that you lacked a "place to work," either alone or in small groups?

Yes	4
No	41
Neutral	2

b. Was your room satisfactory?

Yes	43
No	3
Neutral	1

3. a. Which features of the meeting rooms were inadequate or not conducive to learning?

"Not enough table space."
"Cramped quarters."
"Overcrowded."
"Heavy smog - too much smoking."

b. Which features were especially facilitative in the same regard?
"Availability of computers"
"Good blackboard space."
"Adjacent to computer for most sessions."
"Assistance of staff."

Scheduling and Organization

4. a. Was five days too long a period to leave your work at home for the purpose of attending this session?

Yes	2
No	44
Omit	1

A few indicated that this might be a maximum:
"No, but five days plus the convention is."
"About the maximum."

b. Was five days too short a period in which to learn much of the content of this session?

Yes	32
No	12
Omit	3

"Yes, it should probably be a two week institute."
"Far too short."
"No, but a session after I try this out may help."
"Yes, time to read and 'catch-up' was non-existent."

5. a. Were you allowed enough time in which to pursue activities of your own choosing?

Yes	28
No	19

b. Would you have preferred not to meet in the evening after dinner? It is almost impossible to interpret a "yes" or "no" to item 5b. An answer of "no" involves a double negative, and thus, the lack of interpretation. Where further comments were made, they are quoted:

"Evening meetings were necessary to accomplish objectives."

"Should be left optional for LAB."

c. Would you have preferred more or fewer meetings per day than there actually were? Or was the number of meetings per day agreeable to you?

Would have preferred more	0
Agreeable	33
Would have preferred less	11
Omit	3

6. a. Were the individual lectures too long to sit and listen or take notes?

Yes	10
No	35
Omit	2

b. Were the lectures scheduled in an appropriate sequence?

Yes	40
No	4
Not sure	3

7. Did you have sufficient opportunities to interact with other participants?

Yes	40
No	6
Omit	1

8. a. Were the instructors too inaccessible or unapproachable so that you did not get the individual attention that you desired?

Yes	2
No	45

b. Was it helpful to have graduate student assistants present? (In that none were present, this question is not appropriate to this presession).

9. Did the attempts to evaluate your progress and reactions during the session (and at this moment) interfere with your work here?

Yes	0
No	46
They should be entirely optional	1

10. In general, was the Presession well organized?

Yes	45
Qualified	2

Content and Presentation

11. a. Did the content of the lectures and readings presuppose far more previous training than you had?

Yes	13
No	31
Occasionally	3

b. Should less training in these areas or more have been presupposed?

Less	9
More	9
Same	7
None	12
Did not respond	10

12. To what extent was the content of the lectures and readings relevant to what you hoped to accomplish during the session?

Favorable response	37
Unfavorable response	2
Neutral	3
Omit	5

"Excellent. Surpassed my expectations."
"On the money."
"Slightly different, but relevance became more with time."
"r = .98."

13. a. Were the lectures stimulating and interesting?

Yes	46
No	0
Omit	1

"Very much so."
"Excellent."

b. Were the lecturers competent to speak on the subject assigned them?

Yes	47
No	0

c. Were the lecturers well prepared?

Yes	47
No	0

14. Were you disappointed in any way with the group of participants?

Yes	5
No	42

"Too few women."
"No. A fine group."

Answer each of the following only by checking the more appropriate blank:

15. If you had it to do over again would you apply for this Presession which you have just completed? Yes 42 No 5
16. If a presession such as this is held again would you recommend to others like you that they attend? Yes 44 No 3
17. Do you anticipate maintaining some sort of contact with at least one of the Presession staff? Yes 37 No 10
18. Do you feel that AERA is making an important contribution to education by sponsoring presessions such as this one? Yes 46 No 1
19. Do you feel that anything has happened during these five days to make it more likely that you will leave your present position of employment? Yes 7 No 40
20. Is it likely that you will collaborate in research with someone else attending this Presession (other than those you already were likely to collaborate with)? Yes 30 No 17
21. Do you feel that the staff should feel that it has accomplished its objectives during this five-day presession? Yes 45 No 2

The participants were asked to make comments and suggestions concerning the presession. Their suggestions, and the number of times each suggestion was made, can be summarized as follows:

1. Send out materials (such as Bottenberg and Ward's textbook) before the presession (15)
2. An advanced session to follow up this presession should be arranged (11)
3. More attention should be given to individual problems (6)
4. Some of the session should be made optional (3)
5. There was some problem with turn-around with the computer (2)
6. The name of the presession is misleading (1)
7. More small group discussions should be encouraged (1)
8. The presession should build on classical statistical concepts (1)
9. There is an over-emphasis on LAB (1)

Considering that these suggestions were made without any prompting, it would be difficult to overlook some of the suggestions. In that 15 of the 47 participants who filled out evaluation forms suggested that some of the materials should be sent to participants prior to the meeting, this suggestion would seem to have considerable merit. It might be useful to send out the textbook by Bottenberg and Ward with an appropriate letter explaining in more detail the content of the presession and possible readings the participants could do prior to the presession. The suggestion that the presession might have a somewhat misleading name presents some difficulty. The name, "Multivariate Design and Analysis in Educational Research," would seem to imply the use of the multivariate normal distribution with the several applications. On the other hand, if the name were changed, the attendant difficulties of a name change would ensue.

Some typical comments by the participants follow:

"It would be appropriate to offer a follow-up seminar where interested persons can bring their problems for analysis."
"The prime problem relates to the nature of the topic 'Multivariate Design.' I had in mind a given set of expectations; the seminar addressed itself to a quite different set."
"Roses, leis, or other symbols of appreciation to the staff."
". . . no one was made to feel insecure and not worthy of attention - this is a strong point - We could ask simple and redundant questions and still feel it was o.k. to do so."
"I felt the second session each afternoon was not very productive for me. The limit of assimulative ability had been reached by then . . ."
"This presession will make a permanent contribution to my professional development."
"The money spent by the funding agencies for this session provided more for me per dollar than any money I have spent for 'formal' education anywhere."
"This has been the most important research training I have ever received."
"Send out the Bottenberg - Ward monograph at least one month before the session."
"A more advanced session is needed next summer."
"In general the session was very successful and helpful."
"This kind of thing beats the usual thing that goes on at 'association meetings'."
"The whole idea can be summed up in one word - 'beautiful'."

Summary

When an organization is both secure and successful, it is easier to "accentuate the negative," as opposed to an organization struggling for existence. Thus, this "evaluation" has considered it as axiomatic, from the various responses and the personal experiences of at least some of the authors, that the presession is extremely successful. Thus, this report may seem to dwell on a few suggestions that might serve to improve an already commendable effort. Not all of the suggestions are directed to this particular presession staff. The evaluation questions could still stand improvement, and a more useful application form should be attempted. Additionally, it would be of some interest to find out the extent to which the individual participants had been funded by their own employers to attend the presession. In general, the comment "a job well done" would seem appropriate.

SOME EDUCATIONAL APPLICATIONS OF THE FIXED X MULTIPLE LINEAR REGRESSION MODEL

Samuel R. Houston

As we become more involved with regression techniques, it is to be expected that we will want to focus on application areas peculiar to our educational interests. One technique that has been brought to my attention as a result of the multivariate presession, and to which I've since had some research involvement, is Judgment Analysis (or JAN, as it is more briefly identified). JAN is a policy-capturing model that has been developed at the U.S. Air Force Personnel Research Laboratory. Its use has been explored in several research projects. The studies to date have been primarily directed to problems of a military nature with the goal of capturing a policy in a decision-making situation. It is the purpose of this paper not only to describe the technique but to identify and suggest some educational applications of the policy-capturing model.

Judgment Analysis

What is JAN? JAN is an adaptation of methods developed by Ward (1961) and by Bottenberg and Christal (1961) which groups criteria in terms of the homogenity of their prediction equations in the decision-making process. JAN identifies the captured policy of a group of judges or raters by describing the weights to be applied to scores on a given set of preditor or profile variables in a decision-making situation.

How is the JAN technique applied? An example might best illustrate the process. In considering a number of applicants for a given position, a judge or rater examines each applicant's scores on various profile variables or predictors relevant to a particular job. Instead of evaluating the relative importance of each profile item and weighting the predictor variables to form a selection battery, the judge studies the qualifications of each applicant and ranks the applicants solely on the basis of profile information. The judgment or rank score becomes the applicant's criterion score for the set of profile items or variables used as predictors for that judge. After each judge has made his criterion decisions, the first step in applying the JAN technique is to compute a least squares solution of a multiple regression equation predicting the criterion decisions given by each of the judges. An R^2 value is obtained for each of the judges, and unacceptable judges or raters may be eliminated by comparing the R^2s obtained from their equations with the R^2s computed for the other judges in the sample. Once the list of acceptable judges has been determined, a single value of R^2 is computed to indicate the overall predictive efficiency when all the acceptable individual rater equations are considered. At this point, a criterion-grouping procedure takes place. Christal (1963) discusses the criterion-grouping technique in some detail. Briefly, every individual equation is compared with all others; the two judges who have the most homogeneous equations are located, and the computer determines the single equation that best represents the joint policy of these two judges. The computer then prints the loss in overall predictive efficiency that results when the N original equations are reduced to N - 1 equations. The process continues systematically to reduce the number of groups by one at each step until all judges have been grouped into a single cluster. At each reduction stage, examination of the loss in overall predictive efficiency (the change in R^2) makes it possible to identify the different policies which may exist at that point. If very little predictive efficiency is lost in going from N to 1 equation, then, essentially, one policy is being expressed. If, on the other hand, considerable amount of efficiency is lost at some reduction stage, there is strong evidence that more than one policy is being expressed. At this point, if the purpose is to establish one policy, it will become necessary to return to the judges. the judges will not be asked to arbitrate the differences in weights that are obtained in the expression of the different policies. Instead, they are asked to arbitrate the differences in the rank position of the cases which are responsible for the different policies. Once the rank positions have been obtained from the judges, the computer then solves the system to determine the appropriate set of weights for the predictor variables. This set of weights constitutes the final policy statement.

The JAN technique may well be used in situations in which the primary thrust is not policy formation but rather policy analysis. Some examples of past and anticipated uses of the JAN technique might well serve to illustrate its potential.

Predicting Success in Graduate Education

One example of an application of the JAN techniques is in the area of predicting success in graduate education. In this study two variations of JAN were investigated - Normative JAN and Ipsative JAN. The purpose of the Normative JAN study was to determine the extent to which a policy regarding graduate admission standards existed among twenty representative graduate faculty members at Colorado State College. The selected graduate faculty members who served as judges responded to profile data on thirty randomly selected doctoral graduates who obtained their degrees between 1963-1966. Each judge was asked to rank each student on the basis of profile variable information. Basically, the predictor profile variables consisted of three subsets: a) biographical data; b) test data; and c) major subject field data. Results from the Normative JAN study indicated that there was essentially one policy being expressed by the twenty who served as judges in terms of weightings to be applied to the predictor variables. An analysis of the policy revealed that each of the three subsets of predictor variables contributed significantly to the prediction of the Normative JAN criterion. This suggests that this kind of admissions data provided relevant information for the judges in the determination of their policy.

The Ipsative JAN technique, on the other hand, utilized for its criterion variable the rankings or judgments submitted by the judges who were requested to rank doctoral graduates on the basis of personal knowledge as opposed to profile data information. The judges were requested to select the names of ten students about whom they were knowledgeable and then to rank (without access to profile data information) these students in terms of their estimate of the students' professional promise. The Ipsative JAN technique was not used to determine the extent to which a policy may or may not be present. Primarily, the purpose was to determine the amount of the relationship between the available predictor information and the Ipsative JAN criterion. Results were statistically significant though weak from a predictive viewpoint.

Teacher Selection Policy

Another educational application which involves the JAN technique is taking place at U.C.L.A. and is nearing completion. The purpose of this study is to examine teacher selection procedures. The generic question to be considered is: given the information available, does the hiring policy of district administrators distinguish those teachers likely to perform well in the classroom from those teachers who are not likely to perform well? The first phase of the study seeks to capture what is called *ex ante* teacher preference policy. This is accomplished by asking district hiring officers to rank potential teaching candidates on the basis of profile data information. The twenty-six profile predictors can essentially be grouped into five categories: a) the number of college credits acquired in academic subjects; b) the number of college credits acquired in non-academic subjects; c) the number and nature of academic degrees and honors acquired; d) experiences related to education; and e) biographical information. Next, an attempt will be made to capture the line administrator's evaluation policy of how well each teacher has performed. This model, the *ex post* administrator's evaluation policy, will be obtained by requesting administrators to rank teachers on the basis of teacher profile data. The last aspect of the study will be to compare the *ex ante* policy model with the *ex post* evaluation model.

Curriculum Adoption Policies

An additional application of the JAN technique is another study underway at U.C.L.A. in the area of curriculum decision-making. The primary purpose is to investigate the extent of the relationship between eleven predictor variables and rankings submitted by curriculum experts and/or those who have responsibilities for making choices among curriculum and instructional packages. The independent variables used in the formation of a sample profile of a simulated curriculum package in order to capture a policy include the following eleven predictors: a) valid and significant content; b) significant elements of organizations; c) sequence providing a cumulative effect; d) integration providing horizontal relationships; e) value position clearly stated; f) specificity providing direction; g) flexibility providing alternatives; h) accomodates student differences; i) accomodates teacher competencies; j)accomodates student participation; and k) provides for measurement of achievement. An interesting methodology problem arose in connection with this curriculum study in the area of generating profiles with certain desired statistical properties when real data are unavailable. It was solved by using the technique suggested by Wherry *et al* (1965).

Combining Criteria Via JAN

The methodology for combining criterion variables remains one problem area requiring further development. Bottenberg and Christal (1961) described an iterative technique, programmed for an electronic computer, that at each step reduces the number of criterion clusters and provides optimal weights for the tests. Nevertheless, there are research situations in which the purpose is not to cluster on the basis of retaining optimum predictive efficiency. A case in point is the League of Cooperating Schools Project which is concerned with the study of change in a group of cooperating schools. Here we have a set of _k_ criteria, each of which may be predicted from the same set of _p_ predictors. One way to accomplish grouping of the _k_ criteria is, of course, to use the iterative technique described above. However, if the reason for clustering is one requiring that the combining of criteria be accomplished on the basis of importance defined not by predictive efficiency but expert opinion, then, the iterative approach would not be appropriate. An example of this would be in the situation in which we have _k_ criteria measurements on a given number of schools and are anxious to combine these criteria, not on the basis of retaining optimum predictive efficiency with a given set of _p_ predictors but, instead, on the basis of their importance determined by expert opinion. Therefore, in the League of Cooperating Schools Project we are investigating the utilization of a group of educational experts to develop policy which would define weights to be applied to the set of _k_ criteria in order to come up with an overall evaluation score for each of the schools. In this way, JAN is used as a vehicle for clustering criteria. It should be emphasized, of course, that the JAN technique would be inappropriate in a situation in which it remains the purpose to cluster criteria while retaining maximum predictive efficiency.

Conclusion

It is suggested from even this limited number of applications of the JAN technique that JAN may have wide applicability in educational research.

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Ward, J.H., "Multiple Linear Regression Models," _Computer Applications in the Behavioral Sciences_, Harold Borko (ed.), (Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1962), pp. 204-37.

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DIRECTOR'S COMMENTS

The Planning Period

Gene Glass provided overall coordination that facilitated the entire presession. The method of handling the applications worked quite well.

A total of 78 applications were received. From these applicants 60 were selected. During the period between selection and start of the presession, 10 selectees indicated that they could not attend. Of the 50 participants on the final list, 49 appeared on the first day (one selectee did not arrive and did not send any message). One participant did not return after the first day. The remaining 48 participants worked eagerly during the entire five-day session.

A major factor in the success of the presession was the planning accomplished by Dr. Janos Koplyay at Northwestern University. Dr. Koplyay obtained the use of the computer and classroom facilities on the Northwestern campus at no charge.

Even though the entire staff enjoys putting on the presession, it is apparent that much more staff time is required in presession planning than is allowed for in the budget. It is fortunate that the employers of the presession staff are willing to provide the staff with the time required to carry out the planning necessary.

The Presession

The 1968 presession was designed to eliminate much of the keypunching by participants required in 1967. This new arrangement was far superior to the 1967 session. Almost all of the punched cards were prepared in advance so that keypunching requirements were minimized, allowing more time for problem analysis and arrangement of the input decks for input to the computer.

The 1968 participants brought more computer experience to the Presession than the 1967 group and this common background allowed for concentration on primary objectives rather than basic computer concepts. Two persons who had attended previous regressional model sessions attended the entire presession and assisted the participants. Dr. John Schmid of Colorado State College at Greeley and Sam Houston of the Kettering Foundation interacted with the group. Dr. Schmid attended a similar three-week NSF sponsored course in 1964 and since that time he has devoted much effort in teaching the use of regression models. Sam Houston was a participant in the 1967 AERA Presession.

Comments on Evaluation

The presession can be called "successful" as a result of analysis of written evaluations made by the participants. Follow-up letters from participants indicate that the course content of the Presession has already been implemented in educational research instruction. It is apparent that much interest is being developed in the use of a general regression model approach in the analysis of educational problems.

Many favorable comments were heard during the AERA convention, and the increased interest in regression models in education has resulted in a Multiple Regression Special Interest Group within the AERA. Dr. John Williams, University of North Dakota, has organized the group and is the secretary.

Future Possibilities

It is proposed that USOE consider the possibility of supporting an increased program of instruction based upon the content of this Presession.

A plan might be developed to implement an instructional system that could be introduced into various universities throughout the nation. The program could be handled through the Southwest Educational Development Laboratory, AERA, or both. The following strategy might be appropriate:

1. Develop instructional system
2. Schedule the introduction of the system into existing courses in various universities
3. Implement the necessary computer programs at the universities
4. Work with the staffs at the universities in the introduction of material into the curriculum.

Since there are now many university personnel who are aware of the potential of this approach, it seems that now is a good time to begin such a program.

APPENDIX

APPLICATION FORM

AERA 1968 Research Training

Presessions Program

If after reading a description of the content of the Presessions you are interested in applying to them, please fill out this form and mail it to "AERA Research Training Presessions Program, c/o Laboratory of Educational Research, University of Colorado, Boulder, Colorado 80302."

1. Write the number and title of your first and second choices here:
First choice. No:____Title:____Second choice. No:___Title:___
____

General Information

2. Name:____
Last First Initial

3. Mailing address:_______________________________________
____

4. Sex: M F Age:______Telephone No.:__________________________

5. Present institutional affiliation (e.g. UCLA):____________________
____

6. Have you attended an AERA Presession in the past? Yes No
If "yes" when:________________and which one:______________________

Educational History

7a. Masters' school:___________Year of degree:_______b. Doctoral School:___
Year of dgree:_____
Major________________________Major___________________________________

8a. Record in the blank the approximate number of courses you have taken at either the undergraduate or graduate level in each of the following areas:

a. Anthropology________________
b. Curriculum__________________
c. Educ. Admin._________________
d. Educ Meas or Psychometrics____
e. Elec Computers_______________
f. Linguistics___________________________
g. Math(ex. math educ.)________________
h. Psychol.______________________________
i. Socio_________________________________
j. Stat & Exper Design___________________

b. Describe briefly your training and experience with computers:_________
____

Employment Information

9a. Describe briefly the nature of your present employment:_______________
____
____

b. Describe briefly any changes you expect in your employment during the coming year with respect to either employer or type of activity:______
____
____

10a. What percentage of your time is allotted to teaching?__________
b. What percentage of your time is allotted to research?__________
11. Which courses do you teach (if any), at what level (u.g., g.) and what textbook (if any) might you typically use?

Course	Level	Textbook

Professional and Scholarly Activities

12. What are your primary research interests?
____
____

13. Approximately how many research articles which you have authored alone or jointly have been accepted in a scholarly (refereed) journal?
____

14. In total, about how many research articles, theses or technical reports (both published and unpublished) have you authored alone or jointly?
____

15. How many funded (by USOE, NIMH, Ford Foundation, or other granting agenices) research projects are in progress or completed on which your name appears as either the first or a joint author?
____

16. List no more than three professional societies other than AERA of which you are a member:______________________________
____

Reasons for Applying

17. Please give your reasons for applying to this Presession: